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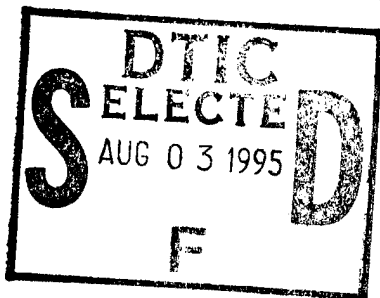


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NAVAL POSTGRADUATE SCHOOL  
Monterey, California



**THESIS**

PERCEPTIONS OF RACIAL  
AND GENDER BIAS IN  
NAVAL AVIATION FLIGHT TRAINING

by

Scot Andrew Miller

December, 1994

Thesis Advisor:  
Co-Advisor:

Lyn R. Whitaker  
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Perceptions of Racial  
and Gender Bias in  
Naval Aviation Flight Training

by

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Submitted in partial fulfillment  
of the requirements for the degree of

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## ABSTRACT

Naval Aviation policy makers are concerned that bias may exist in Naval Aviation flight training. This bias takes two general forms: a negative bias against minority/female flight students, and a double standard bias in which minority/female flight students are given more opportunities to succeed. This study presents an objective, quantitative analysis to determine if evidence of either kinds of bias exist in flight training. A database of several thousand student performance records is the primary source of information. An opinion survey augments the performance data by recording current student and instructor beliefs about bias in the training command. Analysis shows that the success rate of while males in flight training is 10-20 percent higher than that of female and minority students. Efforts to determine the sources of these performance differences remain inconclusive. Multiple regression analysis of pilot Primary flight grades indicates that race may be associated with poorer flight grades. There is potential evidence of a double standard. Female students receive more flight time and instructional hops in Primary pilot training than white males. The opinion survey suggests significant differences in the perceptions of bias between black and white flight students and female and male students.

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## EXECUTIVE SUMMARY

This study is conducted to determine if there is evidence of bias in Naval Aviation flight training. The potential bias can take two general forms; a negative bias against minority/female students, and a double standard bias in which minority/female students are given more opportunities to succeed. While anecdotal evidence of both biases abounds, an analytical study of the topic would give the issue better definition. Therefore, the objectives of this study are to produce quantifiable evidence to answer the following questions:

- \* Is there bias against minority flight students in Naval Aviation flight training that reduces their success rate in the flight program?
- \* Is there bias against minority flight students in Naval Aviation flight training that reduces their opportunities to select the career enhancing Strike pipeline?
- \* Is there bias against female flight students in Naval Aviation flight training that reduces their success rate in the flight program?
- \* Is there a double standard, where minority/female flight students are given a greater opportunity to succeed in Naval Aviation flight training than their white male counterparts?

The data available for analysis is primarily derived from the flight student data bank operated by the Naval Aerospace and Operational Medical Institute (NAOMI), in Pensacola, Florida. Student records from 1989-1991 are used in the analysis. Supplementary data are available from a variety of sources which are maintained by the office of the Aviation Community Manager at

the Bureau of Naval Personnel in Washington, D. C. An opinion survey is also implemented to augment the student performance data. The survey asks flight students and instructors about their perceptions of bias in the training command. There are 250 flight student and instructor respondents to the survey.

White male students succeed at a rate 10-20 percent greater than female and minority students for the overall flight program. Significant differences occur in the pilot Primary and NFO Primary, Intermediate, and Advanced phases of flight training. Logistic regression models are used to determine if performance differences in these four phases are related to test scores and academic grades or to race and gender. In Pilot Primary, NFO Primary, and NFO Advanced phases of training either race or gender are significant explanatory variables for the performance differences. Unfortunately, because of insufficient satisfactory independent variables, all four of the resultant models possess limited explanatory power. This shortcoming mitigates against drawing a conclusion that race and gender are significant factors that affect performance. In simple terms, evidence of possible negative bias is inconclusive. However, a separate multiple regression analysis of pilot Primary flight grades indicates that race may be a factor associated with poorer performance.

Analysis of the double standard issue indicates that female student pilots receive more flight time and instructional flights in the Primary training phase. Otherwise, there is no significant evidence of double standard bias from either the student

performance data or the opinion survey. However, analysis of the opinion survey reveals these pertinent results:

- \* Black students agree significantly more than white students with five statements implying that the Navy has problems with racial bias.
- \* Female students agree significantly more than male students with three statements implying that the Navy has problems with gender bias.
- \* There is no difference in the survey responses between students in the Primary, Intermediate, and Advanced phases of training.
- \* Instructors disagree significantly more than the students with statements suggesting that white students get more warm up and extra time flights and receive more unsatisfactory grades before being removed from the flight program.

There are several conclusions. The data show that black, Hispanic, and female students have a lower overall success rate in flight training than their white counterparts. Attempts to find satisfactory explanatory factors for these differences based on the data prove unsuccessful signifying that either there is a bias or that there are important explanatory factors missing from the data base; for example, those that measure motor skills. Multiple regression analysis shows that race may be a factor in lower Primary phase flight grades. The study discloses that female flight students receive more flight time in the pilot Primary phase. Interestingly, 29 of 100 opinion survey written comments specifically suggest that women are graded easier and/or receive more downs before being attrited.

## I. INTRODUCTION

### A. BACKGROUND

In the last twenty years Naval Aviation has made significant strides in increasing minority and female representation. According to the Navy Military Personnel Command (NMPC), the number of black<sup>1</sup> aviators has increased from 42 in 1974 to 375 today. Similarly, the number of females aviators has risen from just ten in 1974 to 436 today (Sloane 1994). Already two female Naval Aviators have served as squadron Commanding Officers while several black and Hispanic Naval Aviators and Naval Flight Officers (NFO) have attained flag rank. In fact one black NFO, Rear Admiral Benjamin Hacker (retired), served as the first patrol community NFO flag officer of any color. With increasing minority and female representation, though, one untoward effect is the potential for bias<sup>2</sup> in Naval Aviation flight

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<sup>1</sup>The terms "black" and "Hispanic" are used to provide consistency with past military equal opportunity research. No value judgment is implied by the use of these labels as opposed to more contemporary terms such as "Latino" and "African-American." For simplicity's sake the terms "white" and "black" are used throughout to refer to non-Hispanic whites and non-Hispanic blacks. It is recognized that Hispanics may be of any racial/ethnic group.

<sup>2</sup>As a baseline comparison, a Naval Aerospace Medical Research Laboratory (NAMRL) study in 1988 compared the performance of 50 white and 50 black flight students. The students were matched on entrance test scores, accession source, and college background. The comparisons revealed that the overall attrition rates were equal, the pipeline assignments were equal for both groups, and the pipeline (pilot and NFO) attrition rates were equal.

training. This bias, if in fact it does occur, can take two forms:

- \* Negative bias against specific racial/gender groups of individuals, like females or non-white males, that might unfairly inhibit their performance in Naval Aviation flight training, or
- \* Reverse bias, where specific racial/gender groups are given preferential treatment in flight training over the majority group. This will be denoted as the bias of a "double standard" throughout the text.

Bias in either form can have an insidious effect on Naval Aviation in general, but a major, highly visible impact on four Naval Aviation issues specifically. These four areas are minority accession, pilot classification, female integration, and program opportunity. These issues are discussed in greater detail below.

### **1. Minority Accessions**

According to figures released by the Office of the Aviation Community Manager (PERS-211V), the percentage of blacks in Naval Aviation (2.3 percent) already exceeds the percentage of black Air Force aviators (1.65 percent), black submariners (0.9 percent), and black Navy special warfare officers (1.2 percent), and is on par with the airline industry (1-3 percent) (Miko 1993a). The Navy's Affirmative Action Plan long range goal is to achieve a Naval Aviation force with a minimum of three percent black aviators by FY-96 (Helm 1992). Table 1 shows the frequency and percentage of minority and female officers in Naval Aviation as of January 1994.

**TABLE 1. FREQUENCY AND PERCENTAGE OF THE RACIAL/ETHNIC AND GENDER COMPOSITION OF AVIATION OFFICERS**

	Number of Officers				Percent of Total			
	White/ Other	Black	Hispanic	Total	White	Black	Hispanic	Total
Male	15468	368	425	16261	92.9	2.20	2.60	97.7
Female	373	7	11	391	2.2	.04	.07	2.3
Total	15841	375	436	16652	95.1	2.30	2.60	100.0

If negative bias against minority flight students exists, that bias is clearly counterproductive to the Navy's goal of increasing minority representation in Naval Aviation. Such bias may thwart recruiting efforts to assure a steady flow of minority accession to Naval Aviation and decrease the success rate of minority flight students in Naval Aviation flight training. The following Pensacola News Journal article dated 19 October 1992, accentuates the concern over this potential bias when it alleges in part:

...black aviators often face subtle and intangible forms of discrimination, such as tougher grading in flight school...[they] fare poorly during initial training.

Negative media attention such as this can discourage potential minority flight school applicants and further exacerbate the Navy's efforts to increase minority representation.

## **2. Pilot Classification Concerns**

After completing the first two stages of flight training, student pilots are placed into one of four training pipelines for the balance of their training. These four



training pipelines are the following (with type of missions in parentheses) :

- \* Strike (fighter, attack, electronic warfare, carrier based surveillance)
- \* Maritime (patrol, command and control, electronic surveillance)
- \* E-2/C-2 (fleet air surveillance, carrier on board delivery)
- \* Helicopter (anti-submarine warfare, utility)

This classification procedure is known as "pipeline selection", and the student's flight grades, personal preferences, and the needs of the Navy are used to select students for each pipeline.

According to NMPC, 77 percent of all Aviation Flag Officers hail from the fighter and attack communities, communities that comprise only 22 percent of Naval Aviation (Sloane 1994). Recent Naval Aviation Training Command figures (U. S. Department of the Navy 1993) show that black and Hispanic student pilots are selected to the Strike pipeline, which trains the future fighter and attack pilots, at a rate of 14 percent versus 24 percent for white student pilots. This ten percent spread suggests that there could be negative bias that prevents more black or Hispanic student pilots from being selected into this career enhancing pipeline and thus limiting their potential for flag rank selection. This issue is highlighted in the same previously cited Pensacola News Journal article when it states:

Black aviators are assigned to fighter and attack planes at half the rate of white aviators...52.5 percent of black aviators are assigned to helicopters, a generally less prestigious assignment...the Navy doesn't want blacks to fly jets.

### **3. Female Integration**

From 1948 until 1991 the combat exclusion rule (Department of Defense Organization Act 1948) precluded assigning females to combat aircraft squadrons, thus limiting the number of females that could be admitted to Naval Aviation. In 1993, then Secretary of Defense Aspin ordered the services to assign females to all combat aircraft squadrons, thus removing any accession restrictions on females entering the flight program. A worldwide survey of Air Force, Navy, and Marine Corps aviators conducted in 1992, however, reported that 69 percent believed that women should not be assigned to combat aircraft (Presidential Commission on the Assignment of Women to the Armed Forces 1992, 28-29). Such male beliefs, coupled with an increasing number of female flight students, might manifest themselves in negative bias against females which in turn could unfairly reduce their flight training success rate.

### **4. Flight Program Opportunity**

The Office of the Aviation Community Manager (PERS-211V) is responsible for the efficient career management of the Navy's aviation officers for the Chief of Naval Personnel (CNP). In this capacity, this office has daily interaction with fleet aviation squadrons. Informal conversations with

staffers in this office indicate an increasing fleet concern over instances of a double standard in Naval Aviation flight training; that is, minority/female students are perceived to receive more opportunities to succeed in flight training than white males (Miko 1993b). This impression was highlighted last year by a message from a deployed Carrier Group Commander that stated in part:

Dominating issue is perception of double standard with respect to physical and training requirements. Many cited...*training command* experiences where the majority were discriminated against by a system biased towards accommodating female trainees.

Whether these "training command experiences" represent common practices in Naval Aviation flight training or are just isolated episodes is unknown. If a double standard bias does exist in flight training, it would have an adverse effect on fleet aviator quality, unit morale, and combat readiness.

#### **B. RESEARCH OBJECTIVES**

The purpose of this study is to objectively determine whether there is evidence of racial and sexual bias in Naval Aviation flight training. The exact objectives are to determine if there is quantifiable evidence to answer the following questions:

- \* Is there bias against minority flight students in Naval Aviation flight training that reduces their success rate in the flight program?
- \* Is there bias against minority flight students in Naval Aviation flight training that reduces their opportunities to select the career enhancing Strike pipeline?

- \* Is there bias against female flight students in Naval Aviation flight training that reduces their success rate in the flight program?
- \* Is there a double standard, where minority/female flight students are given a greater opportunity to succeed in Naval Aviation flight training than their white male counterparts?

### **C. ORGANIZATION**

The next chapter provides an overview of the training system that produces the annual requirement for Naval Aviators (pilots) and Naval Flight Officers as well as a description of the data. The third and fourth chapters describe the methodology and analysis used to investigate the study objectives. The fifth and final chapter summarizes the results, provides conclusions, and suggests areas for further study.

## **II. BACKGROUND AND DATA DESCRIPTION**

### **A. INTRODUCTION**

This chapter contains three parts. First is a brief summary of the Naval Aviation flight training program<sup>3</sup>. The second part describes the various data sets and their sources. The third discusses an opinion survey used to improve the analysis.

### **B. FLIGHT TRAINING**

Potential flight accessions are screened physically and academically before admission. Students first attend preflight training. They are then split into the pilot and NFO training tracks, known as pipelines, and begin Primary training. Figure 1 depicts the three phases of the pilot training program; Primary, Intermediate, and Advanced. It also gives the aircraft and hours flown in each phase. Note that the pilot pipeline selection occurs relatively early in the training program.

Figure 2 outlines the NFO training pipeline and shows the various training phases. When the flight students complete their respective programs, they receive their "Wings of Gold", identifying them as Naval Aviators or Naval Flight Officers.

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<sup>3</sup>Appendix A gives a more detailed description of the flight training process.

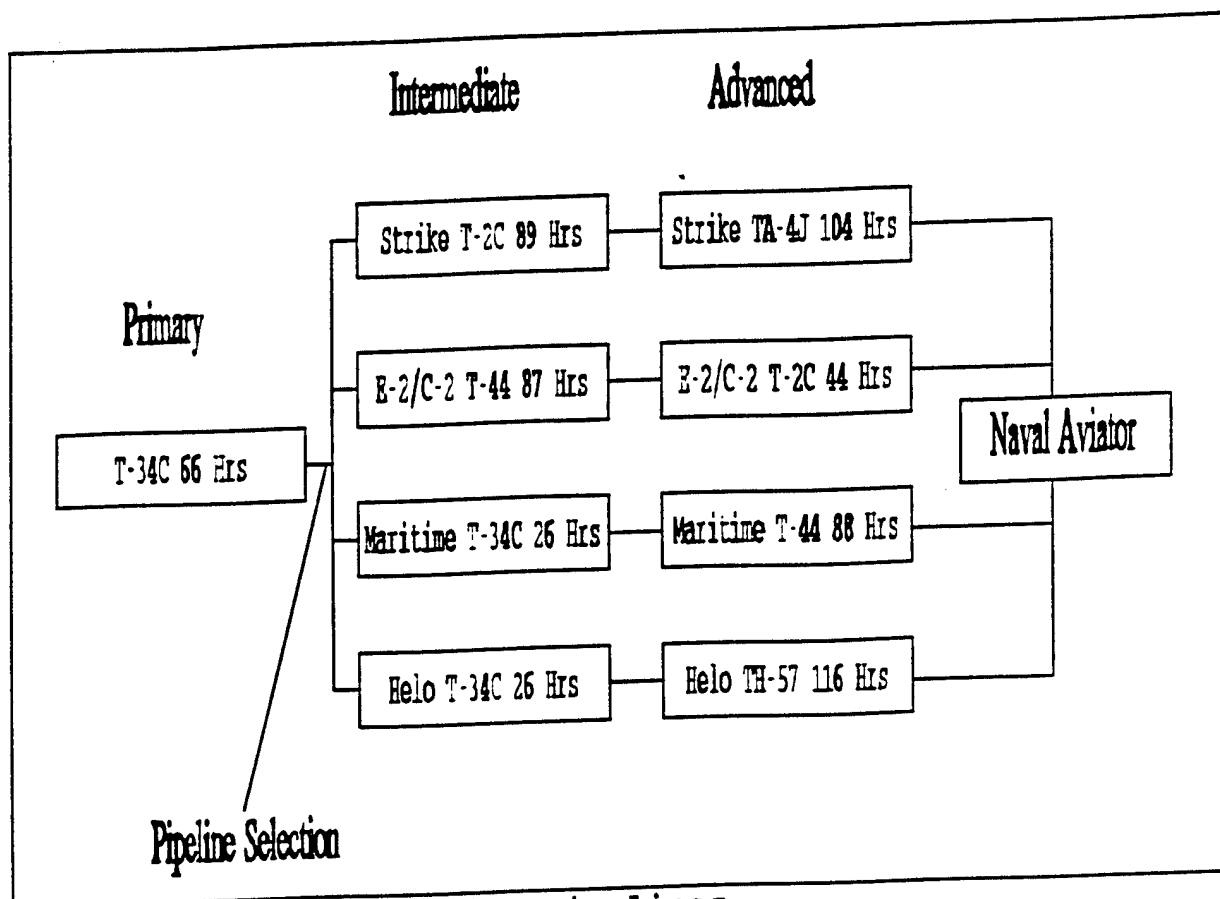


Figure 1. Pilot Training Pipelines

They then proceed to various Fleet Replacement Squadrons where they learn to fly and fight fleet aircraft.

Students are graded on every simulator and flight event. Specific skill areas are routinely evaluated and the following grades are assigned:

- \* Above average
- \* Average
- \* Below average
- \* Unsatisfactory (also known as an "Unsat" or a "Down")

An unsatisfactory grade not only contributes to a lower overall grade average, it also indicates a flight failure, requiring well defined administrative action (U. S. Department

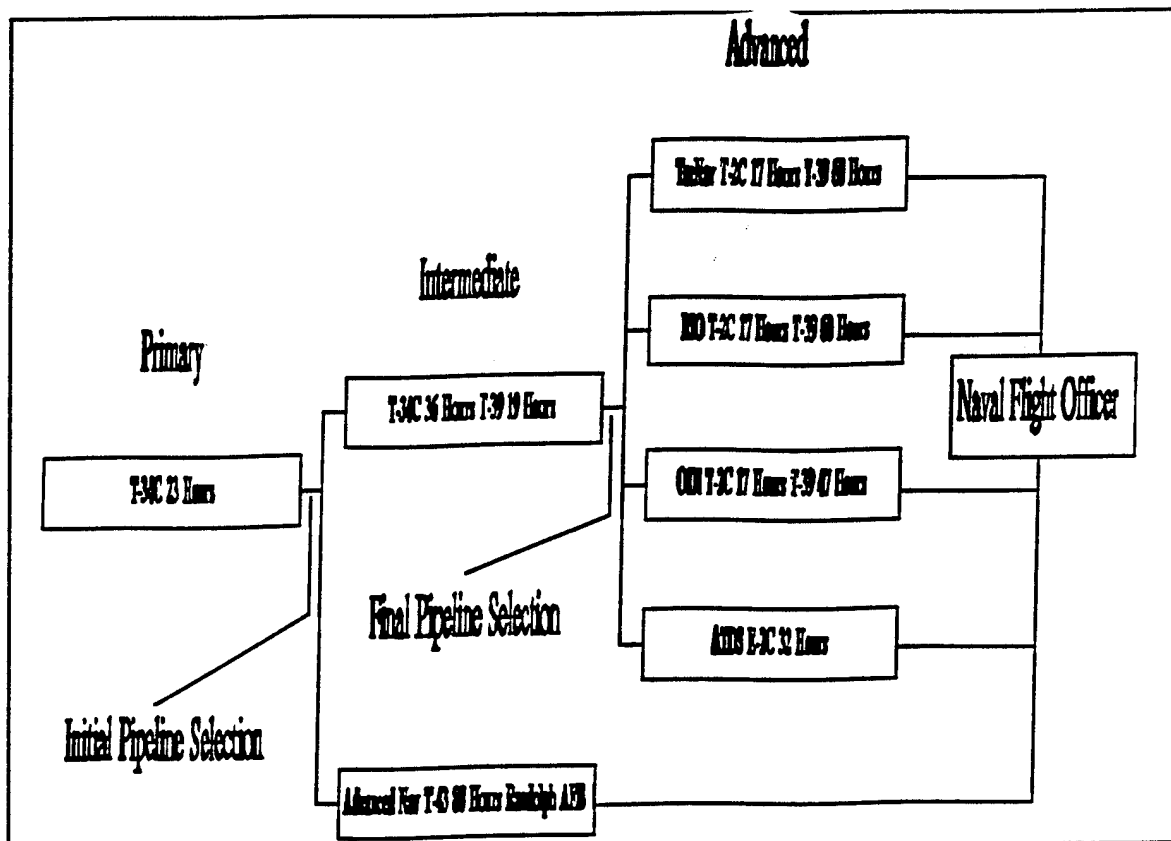


Figure 2. NFO Training Pipelines

of the Navy 1993). This action has an important bearing in the analysis of a double standard. Each unsatisfactory flight grade is a significant negative training milestone that requires the following procedures:

- \* Several senior instructors review the training jacket and determine training trends and weaknesses. They then make a recommendation for one or two non-graded practice flights (called ETs for "extra times").
- \* After the extra time flights are completed, the originally downed flight is repeated with a different instructor.
- \* Second and subsequent downs require administrative board action, where attriting<sup>4</sup> (removing) the student from the

<sup>4</sup>The word attrite is used frequently in this text. Attrite is the term used in Naval Aviation to describe the removal of an individual from flight training for any reason. While there are

flight program is one alternative. Such a recommendation must be approved up the chain of command through the cognizant training wing commander and is also reviewed at the headquarters of the Chief of Naval Air Training (CNATRA).

Historically, students have been attrited after two downs in a single stage, but there is considerable variation in the attrition process.

### **C. DESCRIPTION OF AVAILABLE DATA**

The principal data source for the present analyses is the master training files of the Naval Aerospace and Operational Medical Institute (NAOMI) in Pensacola, Florida. NAOMI maintains an extensive data base of the training records of all student pilots and NFOs. The salient variables drawn from this data base are race/ethnic background, gender, Academic Qualification Test<sup>5</sup> scores, Flight Aptitude Rating, Background Inventory, Preflight and Primary phase academic scores, training stage flight grades, completion codes, flight hours, type of college degree, and pipeline selection.

The NAOMI data analyzed for this report are from students enrolled in flight training from 1989-1991. A total of 3876 records are available. Only white, black, and Hispanic students are used in the study, reducing the total number of records by 95. Records of Aviation Intelligence Officers (510

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many reasons for attrition, such as disciplinary causes, failure to meet medical standards, or academic failure, the attrition referred to in this text usually denotes removal from the flight program because of the inability to meet minimum performance standards.

<sup>5</sup>These terms are described in the Glossary, Appendix B.



records) are also removed because their curriculum includes only preflight training. Twenty-five other records are also incomplete, leaving 3246 records with useful information for the initial analysis. The student demographic breakout is summarized in Table 2.

**TABLE 2. NUMBER OF NAOMI STUDENT RECORDS BY RACE/ETHNICITY AND GENDER FOR 1989-1991**

Seat	Gender	Black	Hispanic	White	Total
NFO	Male	47	20	754	821
	Female	3	0	17	20
	Total	50	20	771	841
Pilot	Male	76	37	2215	2328
	Female	3	3	71	77
	Total	79	40	2286	2405

PERS-211V provides additional data that complements the NAOMI database. This information includes annual success rates of Naval Aviation flight students broken down by sex, race, and ethnic background. It also provides a snapshot of the success rates of various Aviation Officer Candidate School (AOCS) year groups, again sorted into groups by sex, race, and ethnic background. Pipeline selection percentages are also included.

Supplementary information on AOCS and Aviation Preflight Indoctrination (API) class demographics by race and gender is also available (Anderson 1993). The data includes attrition rates by race and gender.

#### D. OPINION SURVEY DESCRIPTION

To provide additional information for analysis, an opinion survey is administered to students and flight instructors in Naval Aviation flight training commands. The purposes are twofold: identify perceptions of double standard bias and gain insight into the overall feeling of racial and gender bias in Naval Aviation flight training. To do so, the survey is divided into four parts containing:

- \* Part one: Specific statements concerning double standard bias
- \* Part two: General statements concerning racial and gender bias
- \* Part three: Biographical questions
- \* Space for general comments

In the first two parts, the respondent is asked to circle a number, one through seven, corresponding to the extent to which they agree or disagree with the statement, with the number "one" indicating strong disagreement, "four" signifying no opinion, and "seven" indicating strong agreement. The analysis of the opinion survey consists of a five step process as outlined in Carmines and McIver (1981, 18-19). The median and the interquartile range are computed for each statement.

Part one of the survey is shown in Figure 3. This portion of the survey is designed to evaluate perceptions about the extent to which five training command practices affect the progress of various student subsets. The five practices to be

Figure 3. Opinion Survey Part One

## A SURVEY OF PERCEPTIONS OF BIAS IN NAVAL AVIATION FLIGHT TRAINING

This three part survey is designed to evaluate student and instructor perceptions of bias in Naval Aviation flight training. *Part One* evaluates your perceptions regarding the extent to which five practices may impact the progress of various student subsets. *Part Two* assesses topics which bear on possible differential treatment. *Part Three* requests general background information. This survey is designed to be completed in about 5 - 10 minutes.

**PART 1.** The following matrix lists five practices across the top with a *seven point rating scale* depicting the extent to which you *disagree or agree* that these practices occur in the *five student groups* listed at the far left column. For each seven-point rating scale, circling a "1" indicates you *STRONGLY DISAGREE*, circling a "4" indicates you have a *NEUTRAL OPINION*, and circling a "7" indicates you *STRONGLY AGREE* that the practice occurs.

Mark the place on the rating scales for each practice that best conveys *your perception that these practices occur* in the five different student groups. *Written comments are solicited and will be added to the survey results.*

*This student group:*

<i>Student Group</i>	<i>is awarded more warm-ups and ETs.</i>	<i>is scheduled on a more regular basis.</i>	<i>is graded harder.</i>	<i>gets more downs before being attrited.</i>	<i>receives special treatment.</i>
<i>White</i>	1-2-3-4-5-6-7	1-2-3-4-5-6-7	1-2-3-4-5-6-7	1-2-3-4-5-6-7	1-2-3-4-5-6-7
<i>Black</i>	1-2-3-4-5-6-7	1-2-3-4-5-6-7	1-2-3-4-5-6-7	1-2-3-4-5-6-7	1-2-3-4-5-6-7
<i>Hispanic</i>	1-2-3-4-5-6-7	1-2-3-4-5-6-7	1-2-3-4-5-6-7	1-2-3-4-5-6-7	1-2-3-4-5-6-7
<i>Female</i>	1-2-3-4-5-6-7	1-2-3-4-5-6-7	1-2-3-4-5-6-7	1-2-3-4-5-6-7	1-2-3-4-5-6-7
<i>Weaker Students</i>	1-2-3-4-5-6-7	1-2-3-4-5-6-7	1-2-3-4-5-6-7	1-2-3-4-5-6-7	1-2-3-4-5-6-7

evaluated represent potential measures of double standard bias. The term "Weaker students" is defined as those students who are having some degree of difficulty with the flight program independent of race or gender. The use of the "Weaker student" distractor is intended to provide validation of the survey results, since it makes sense that "Weaker students" should get more warm up flights, extra time flights, and flight hours than anyone else.

The second survey part contains ten statements that address race and gender bias. The purpose of this section is to gain a qualitative "feel" for current perceptions of race and gender bias in Naval Aviation flight training. Figure 4 contains survey part two.

Part three is a biographical questionnaire which is intended to enhance the analyses. It facilitates comparisons of the responses among many combinations of groups. These comparisons include race, gender, general pipeline (pilot or NFO), training phase (Primary, Intermediate, or Advanced), and status (student or instructor).

The final survey part solicits general comments. These comments provide a qualitative enhancement to the other survey analyses. They provide a wide spectrum of views and many very pertinent and timely observations, and reading them is highly recommended. Appendix E catalogs all the written comments received from the respondents.

**PART 2.** For each of the following statements, indicate your opinion by marking the place on the rating scale that corresponds with how you feel. Again, written comments are encouraged.

1. *The Navy is more concerned about equal opportunity than the civilian sector.*

Strongly Disagree ——— Neutral ——— Strongly Agree

2. *There are fewer signs of discrimination in the Navy than the civilian sector.*

Strongly Disagree ——— Neutral ——— Strongly Agree

3. *Sexual harrassment is more likely outside of the Navy.*

Strongly Disagree ——— Neutral ——— Strongly Agree

4. *Discrimination against minorities is prevalent in Naval Aviation.*

Strongly Disagree ——— Neutral ——— Strongly Agree

5. *There is resentment of females in Naval Aviation.*

Strongly Disagree ——— Neutral ——— Strongly Agree

6. *There is more bias against females in flight training than in the civilian workplace.*

Strongly Disagree ——— Neutral ——— Strongly Agree

7. *There is more bias against minorities in flight training than in the civilian workplace.*

Strongly Disagree ——— Neutral ——— Strongly Agree

8. *Bias is widespread in the training system, but white males fail to recognize it.*

Strongly Disagree ——— Neutral ——— Strongly Agree

9. *The Naval Aviation Training Command works hard to ensure everyone gets the same opportunity.*

Strongly Disagree ——— Neutral ——— Strongly Agree

10. *I feel that my instructors are usually quite fair to me.*

Strongly Disagree ——— Neutral ——— Strongly Agree

Figure 4. Opinion Survey Part Two

CNATRA approved the use of the survey throughout the Naval Aviation Training Command (CNATRA 1994). Four hundred surveys were distributed to Navy flight students and instructors in Primary, Intermediate, and Advanced phase training squadrons in all pilot and NFO pipelines. Two hundred fifty responses were returned and are used in the analysis. Table 3 shows the demographic breakout of the survey respondents.

**TABLE 3. DEMOGRAPHICS OF SURVEY RESPONDENTS**

By Race/Gender		By Pilot/NFO/Instructor		By Training Phase	
Group	Number	Group	Number	Phase	Number
Black Males	19	Student Pilots	100	Primary Students	50
Hispanic Males	13	Student NFOs	80	Intermediate Students	37
White Males	207	Flight Instructors	70	Advanced Students	93
All Females	11			Flight Instructors	70
Total	250	Total	250	Total	250

### **III. ANALYSIS OF NEGATIVE RACIAL AND GENDER BIAS**

#### **A. INTRODUCTION**

This chapter analyzes student performance data for statistical evidence of bias against minority and female flight students. The first step of the analysis is to establish whether there are any differences between the percentages of black, white, and Hispanic students who complete flight training. When differences are discovered, each of the training phases are investigated to determine specific factors associated with these differences. In addition differences between black, white, and Hispanic student pilot pipeline selection rates are also investigated.

#### **B. DETERMINING DIFFERENCES**

##### **1. Overall Program Differences**

The performance trends of female and minority students are compared with the overall student population to search for obvious performance differences. Table 4 summarizes flight student success rates by race and gender in the NAOMI database for the years 1989-1991. Distinct differences in the proportion of overall program success are apparent. Overall black and Hispanic male student flight school success rates are more than 20 percent lower than white males. Female student success rate is 15 percent lower than white males.

The standard errors are small relative to the differences between the success rates, indicating that there are significant difference between the program performance success rate of white males versus the success rates of minority and female flight students.

**TABLE 4. FLIGHT STUDENT PERFORMANCE SUMMARY, 1989-1991**

Gender	Race and Ethnicity	Number Started Program	Number Completed Program	Percentage of Success	Standard Error (%)
Male	White	3360	2684	79.8	0.7
	Black	170	95	55.9	3.8
	Hispanic	77	45	58.4	5.6
Female	White	135	87	64.4	4.1
	Black	6	3	50.0	20.4
	Hispanic	1	1	100	-

## 2. Pipeline Selection Rate Differences

Pilot pipeline selection is a crucial juncture in a fledgling student's aviation career, and is thus analyzed independently of overall program success. Pilot pipeline selection is based on the primary stage flight grades. Because of the limited jet seats available to women through 1992 they are not included in this analysis. Analysis of NFO pipeline selection is also not performed because NFOs have an almost 85 percent opportunity to select a career enhancing carrier based pipeline.

Table 5 shows both pilot pipeline preferences and selection performance. A Navy Standard Score of 49 in primary



is the minimum score required to be eligible to select the strike pipeline.

**TABLE 5. PIPELINE PREFERENCE AND SELECTION PERFORMANCE**

Race	First Choice Strike (%)	Selected for Strike (%)	Selection Standard Error (%)	Choice to Selected Ratio (%)	Ratio Standard Error (%)	Mean Primary Flight Grade	Flight Grade Standard Error
White	49.2	28.4	0.8	56.9	1.8	51.8	10.74
Black	33.8	20.0	3.3	59.2	10.0	42.5	9.44
Hispanic	32.5	22.0	4.8	67.7	13.0	46.8	13.21

White males are selected more frequently for the strike pipeline. Of the students who desire the strike pipeline, black and Hispanic students actually have a better chance of being selected. This is a misleading comparison. In preflight training 70-90 per cent of all potential pilots initially indicate that the strike pipeline is their first choice. After their initial flying experiences, many students with average or below average flight grades change their first choice to a pipeline that they will have a realistic chance to select. Table 5 discloses that the average black and Hispanic student's flight grades are below the minimum strike pipeline cutoff score of 49 so these students choose the helicopter or maritime pipelines as their first choice, although telephone interviews with Primary training squadron Commanding Officers confirms that many still desire the strike pipeline (Derkin, Lynch, and Mallory 1993).

The standard errors are small relative to the difference between the pipeline selection rates for white and

black student pilots, indicating that there is a difference in selection rates.

### C. EXPLAINING THE DIFFERENCES

#### 1. Overall Performance Differences

To answer whether the performance differences between the student groups<sup>6</sup> can be explained by the student performance data, logistic regression is performed using a set of explanatory factors to predict success or failure in each pilot or NFO training phase. Tables 6 and 7 display success rates for student pilots and NFOs in the training phases.

**TABLE 6. STUDENT PILOT TRAINING PHASE SUCCESS RATES**

Gender	Race	Primary Phase	Standard Error	Intermediate Phase	Standard Error	Advanced Phase	Standard Error
Male	Black	79.2	9.2	97.1	2.0	97.0	2.2
	Hispanic	80.1	8.1	93.8	3.6	93.4	4.1
	White	90.2	0.2	97.4	0.1	95.7	0.1
Female	All	84.7	5.9	98.1	1.1	98.2	1.0

**TABLE 7. STUDENT NFO TRAINING PHASE SUCCESS RATES**

Gender	Race	Primary Phase	Standard Error	Intermediate Phase	Standard Error	Advanced Phase	Standard Error
Male	Black	80.0	10.4	83.8	11.0	75.5	17.9
	Hispanic	92.0	6.2	89.2	8.8	85.8	12.4
	White	96.0	0.2	95.0	0.3	93.7	0.3
Female	All	90.4	8.9	100.0	—	94.1	6.3

Note that the training phase outcomes differ most in the pilot Primary phase and the NFO Primary, Intermediate, and Advanced

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<sup>6</sup>Because the number of female students is small (one Hispanic and six black females for this sample), females are aggregated into one group for these and subsequent analyses.

phases, however the standard errors for these phases are also larger. A logistic regression model is fitted to each of these cases, with the following goals in mind:

- \* Fit a model that explains a significant portion of the variability in success or failure.
- \* Determine if race and/or gender are significant factors in training phase performance.

The first goal requires a measure of the proportion of variability in success explained by the model. In standard multiple regression analysis the R-squared statistic is used to provide a measure of the explanatory power of the linear model and to enable model comparisons. According to Pindyck and Rubinfeld (1991, 268), such a measure is inappropriate for use with a logistic regression model. They suggest the use of the likelihood ratio index defined below

$$\rho = 1 - \frac{L_1}{L_0} \quad (1)$$

where  $L_0$  and  $L_1$  are the maximized values of the likelihoods for the logistic regression model with only an intercept term (no explanatory variables) and for the logistic regression model that includes the variables of interest, respectively. This index also provides a more appropriate measure of explained variability in the model than the usual Pearson's chi-square test statistic because when continuous explanatory variables such as test scores are included in a logistic regression model the asymptotic chi-squared distributions do not hold.

For each logistic regression model fit, the dependent variable is the binary variable which indicates whether a student successfully completes a particular training phase. In the four logistic regression models the independent variables remain the same and are coded as: Sex (0=female, 1=male), Race1 (0=other, 1=black), Race2 (0=other, 1=Hispanic), AQT, FAR, AOCS (0=AOCS, 1=API), ACD (overall Preflight academic grade), and BS (0=non Bachelor of Science degree, 1= has Bachelor of Science degree).

The model also includes interaction terms: Sex and Race, Sex and AOCS, Race and AOCS, AQT and FAR, AQT and FAR and ACD, and the quadratic terms for the variables AQT, FAR, and ACD. The performance data for student pilots and NFOs are considered separately, since there are considerable differences in the style and type of training.

Stepwise variable selection is used to obtain the models. The p-values for the null hypothesis that the coefficients are zero are given in parenthesis under the variables. The fitted models for the four cases are

**Pilot Primary Phase**

$$\begin{aligned} \log [\hat{p}_1 / (1 - \hat{p}_1)] = & 3.28 + .87\text{Race1} - .36\text{BS} - .09\text{ACD} & (2) \\ & (.0001) \quad (.0159) \quad (.0337) \quad (.0001) \\ & + .02\text{AQT} * \text{FAR} - .02\text{FAR} * \text{FAR} \\ & \quad (.0235) \quad (.0019) \end{aligned}$$

Number of Observations = 1123      Likelihood Ratio Index = .08

**NFO Primary Phase**

$$\ln [\hat{p}_2 / (1 - \hat{p}_2)] = -4.16 + 1.56\text{Sex} + .49\text{AQT} + .15\text{FAR} + .5\text{BS} \quad (3)$$

(.0001)    (.0095)    (.0001)    (.0214)    (.0305)

Number of Observations = 518      Likelihood Ratio Index = .11

**NFO Intermediate Phase**

$$\ln [\hat{p}_3 / (1 - \hat{p}_3)] = -5.7 + .21\text{AQT} + .25\text{FAR} + .08\text{ACD} \quad (4)$$

(.0001)    (.0382)    (.0003)    (.0001)

Number of Observations = 518      Likelihood Ratio Index = .13

**NFO Advanced Phase**

$$\ln [\hat{p}_4 / (1 - \hat{p}_4)] = 1.204 + .94\text{Race1} - .45\text{AQT} \quad (5)$$

(.0263)    (.0065)    (.0001)

Number of Observations = 518      Likelihood Ratio Index = .08

where  $\hat{p}_i$ ,  $i = 1, 2, 3, 4$  is the estimated probability of success for pilots in the Primary phase, NFOs in the Primary phase, NFOs in the Intermediate phase, and NFOs in the Advanced phase, respectively. The value of the likelihood ratio index in all cases is .13 or less, indicating that each of these models explains very little of the performance deviations. Possible causes are underspecified models or dependence between the observations.

If models are underspecified, there are explanatory variables that have been left out of the model. Miller (1985) shows that one method to acquire aviation skills is a combination of book learning and rote memorization practiced while performing a simple motor skill. It is suggested that such similar experience indicators such as years of driving experience (Derkin 1993), previous flight experience, and skill sport participation may better explain flight school

performance than these models based solely on academic parameters.

An example that could cause a dependence between observations would be an AOCS class with several charismatic and motivational leaders. Such individuals may wield a significant positive influence on their classes' overall success, regardless of individual academic or motor skills. To determine if such effects do exist, a model that compares student groups but blocks by AOCS class may remove the dependent effect among observations and make for a more realistic study.

In three of the four cases a race or gender factor is significant. A method devised by Pindyck and Rubinfeld (1991, 286) shows what effect a change in the race from white to black or in gender from male to female causes in the success rate when holding the other variables constant at their mean levels. Table 8 displays these effects for the three models.

**TABLE 8. PERFORMANCE CHANGE DUE TO RACE OR GENDER FACTOR**

Model	Factor	Effect on Phase Success (%)
Pilot Primary Phase	Race (black)	-14.1
NFO Primary Phase	Gender (female)	-32.4
NFO Advanced Phase	Race (black)	-10.2

Though not derived from powerful explanatory models, as previously discussed, such results are meaningful. Of all the possible explanatory variables, it is noteworthy that being

black or female indicates a significantly lower performance. While not overwhelming evidence of possible bias, there does appear to be enough association of the race and gender factors with lower performance to warrant further study.<sup>7</sup>

## **2. Pipeline Selection Differences**

Multiple regression analysis is used to explore the pilot pipeline selection differences between black, white, and Hispanic male student pilots. The model predicts primary flight grades and determines if the flight grades are accounted for strictly by performance factors or whether race has an impact. The same explanatory variables used in the previous section are used with the addition of one other variable, PACD, which is the Primary phase academic grade.

The final form of this model is derived by regressing the standardized<sup>8</sup> Primary flight grades against the explanatory variables, using stepwise selection. This technique results in a model consisting of only those explanatory variables that are significant at a .05 level. P-values to test the null hypothesis that the coefficients equal zero are given in parentheses and are listed under the respective coefficients.

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<sup>7</sup>Of note, 100 of 250 survey respondents provide additional written comments. Only six of these 100 comments report bias against minorities. However, four of the seven black students who comment are among those six responses indicating racial bias.

<sup>8</sup>The Navy uses a 20-80 scale with 50 as the mean and 10 as the value of one standard deviation.

$$\begin{aligned}
 E[\hat{PGRD}] = & 0.93 - 3.14Race1 + 0.67ACD + 2.53BS & (6) \\
 & (.64) \quad (.005) \quad (.000) \quad (.000) \\
 & + 0.75AOCS + .0018ACD*PACD + .05AQT*FAR \\
 & (0.05) \quad (.000) \quad (.000)
 \end{aligned}$$

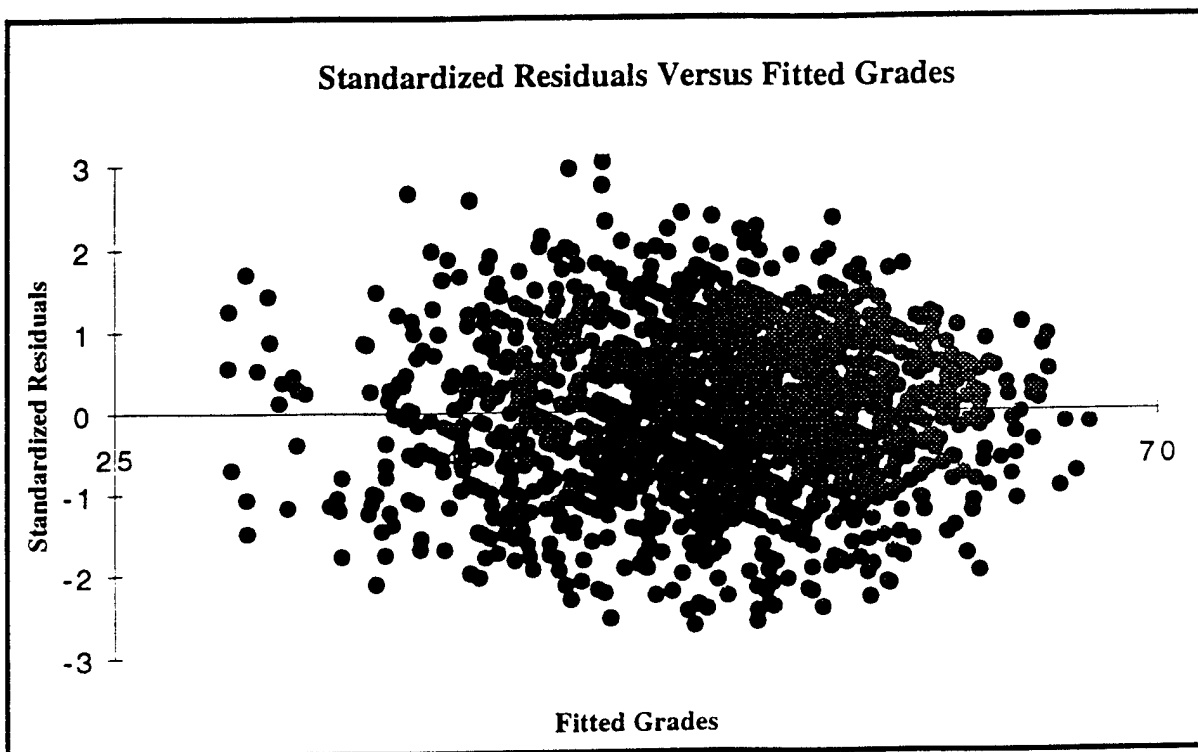
Number of Observations = 1507    R-Squared (adjusted) = 45.0%

where  $E[\hat{PGRD}]$  is the estimated expected primary flight grade. The resultant model explains 45.0 percent of the total variation.

In the model the race (black) factor is significant at the .01 level. With all other model variables being equal, the black student pilot expected flight grade is 3.14 points (with a standard error of 1.15) less than the non black Primary student pilot flight grade. The difference of 3.14 points has practical significance, given that pipeline selection decisions are sometimes made on grade differences of one point.

To examine the appropriateness of this linear model, residual analysis is conducted. Each independent variable is plotted against the residuals to check for linearity; in this case there are no problems found. Figure 5 plots the model standardized residuals against the fitted primary grades. Because the standardized residuals fall between two and negative two, appear to be randomly distributed around zero, and show no distinct pattern of variation, the model appears to be adequate.





**Figure 5. Standardized Residuals Versus Fitted Grades for the Full Model**

To be sure, the same residual plot is repeated in Figure 6, using only the data derived from the black student pilots. Again the residual plot shows no unusual pattern or distribution, confirming that the model is representative for all the observed student groups.

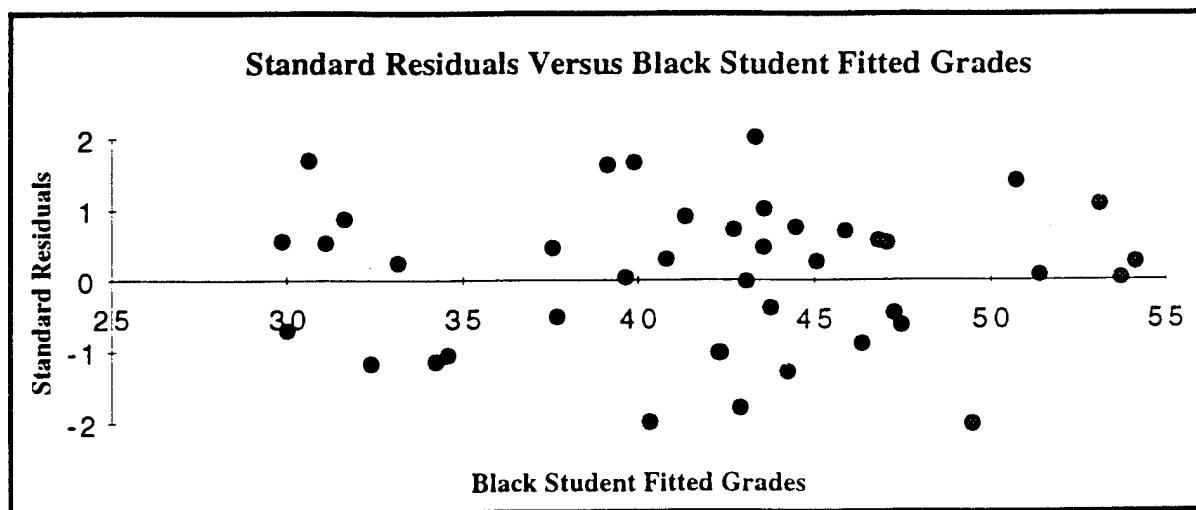


Figure 6. Fitted Grades Versus Standardized Residuals for Black Student Pilots

#### IV. ANALYSIS OF DOUBLE STANDARD BIAS

##### A. INTRODUCTION

The Office of the Aviation Community Manager (PERS-211V) has suggested the following measures as potential indicators of double standard bias (Miko 1993b):

- \* Number of flight hours
- \* Number of instructional flights
- \* Number of Unsatisfactory flights before attrition
- \* Number of extra time flights per an Unsatisfactory grade
- \* Number of warm up flights

Since this office is populated by staffers with many years of accumulated experience in the Naval Aviation community in general and Naval Aviation flight training in particular, their measures are adopted to guide this analysis of the performance data and opinion survey for evidence of double standard bias.

The basic premise behind using these measures for detecting a double standard assumes that attriting poorly performing female/minority students is more difficult than attriting poorly performing white males. This premise follows if one assumes that the CNATRA organization is under pressure to help the Navy meet a predetermined goal of minority/female aviation accessions and thus is significantly more inclined to give such students a greater opportunity to succeed.

The governing CNATRA flight training instruction (U. S. Department of the Navy 1993) gives discretion to the individual instructors and squadrons on such items as number of warm up flights, the number of extra flights assigned after an unsatisfactory event, and the length of each individual flight. These particular items figure prominently in the measures proposed by the Office of the Aviation Community Manager.

Two measures of double standard bias are analyzed quantitatively with the student performance data. The analysis of the remaining three measures using the student performance data fails to shed further light on the double standard bias, so further examination of these measures is continued by analyzing the results of the opinion survey.

## **B. QUANTITATIVE ANALYSIS**

### **1. Average Flight Hours**

The first measure of double standard bias to be analyzed is the average amount of flight time for each student group. Both Primary phase flight time and total flight time are compared, for both pilot and NFO students. To conduct the analysis, a one way analysis of variance (ANOVA) is used.

Primary pilot flight hours for each student group are compared first. The ANOVA tests the null hypotheses that the means of Primary flight hours for each student group is the same versus the alternative that at least one mean is different. Figure 7 contains the results of the ANOVA test.

ANALYSIS OF VARIANCE OF PILOT PRIMARY FLIGHT HOURS

<u>SOURCE</u>	<u>DF</u>	<u>SS</u>	<u>MS</u>	<u>F</u>	<u>P</u>
tmt	3	3226	1075	8.29	0.000
ERROR	1366	177097	130		
TOTAL	1369	180323			

<u>LEVEL</u>	<u>N</u>	<u>MEAN</u>	<u>STDEV</u>
FEMALE	38	88.67	9.44
BLACK MALE	29	84.02	10.88
HISPANIC MALE	12	79.52	8.35
WHITE MALE	1291	79.95	11.47

INDIVIDUAL 95% CI'S FOR MEAN BASED ON POOLED STDEV OF 11.39

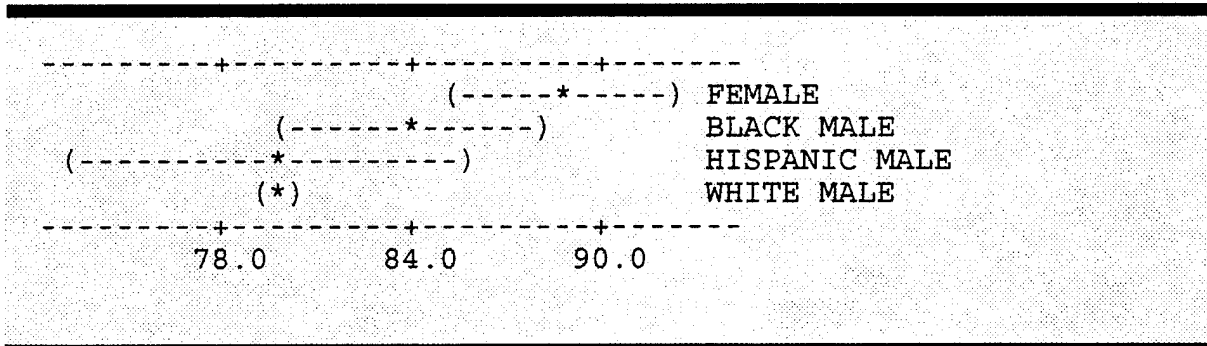


Figure 7. Pilot Primary Flight Hours

The F statistic equals 8.29, which yields a p-value of near zero. Thus, there is very strong evidence that at least one of the means is not equal to the others.

The confidence interval plot in Figure 7 suggests differences between female student pilots and the other student groups. To find which means are different, tests for the six pairs of student groups are conducted and the results are summarized in Table 9. Using Bonferroni's inequality, an  $\alpha = .05/6 = .00833$  for each test gives an overall level of significance of at least .05. The tests conclude that female pilot Primary flight students receive significantly more

**TABLE 9. PAIRWISE MEAN COMPARISON FOR PILOT PRIMARY FLIGHT HOURS**

Pair	Mean	Standard Deviation	Z Stat- istic	p- value	Reject/ Accept
Female-White Male	88.7 79.9	9.4 11.5	4.77	.0003	Reject
Female- Hispanic Male	88.7 79.5	9.4 8.4	3.04	.002	Reject
Female-Black Male	88.7 84.0	9.4 10.9	1.87	.061	Accept
Black-White Male	84.0 79.9	10.9 11.5	1.90	.057	Accept
Black- Hispanic Male	84.0 79.5	10.9 8.4	1.32	.186	Accept
White- Hispanic Male	79.9 79.5	11.5 8.4	1.40	.081	Accept

flight hours in Primary training than either white or Hispanic male flight students.<sup>9</sup>

Figure 8 displays the results of the next ANOVA, comparing the total flight hours received for each of the student pilot groups. Note the F statistic is 1.62 and the p-value is .182, so there is insufficient evidence to reject the null hypothesis that there is no difference in the mean total flight time among the pilot student groups.

Figure 9 and 10 show the ANOVA procedures performed on the Primary phase and total flight hours received by the NFO student groups. In both cases the F statistics are low and the p-values high (.292 and .419 respectively), so again there is insufficient evidence to reject the null hypothesis that there are no significant differences in the mean flight hours for NFO student groups in the Primary phase or in the overall training program.

## **2. Analysis of Average Number of Instructional Flights**

To compare the average number of instructional flights received by student groups, ANOVA is again used. Since the number of flight hours and the number of flights are related, it is no surprise that the results of the ANOVA are similar.

Figure 11 shows the results of the ANOVA test that is conducted on the student pilot Primary phase instructional

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<sup>9</sup>Of the 100 written survey comments, 29 specifically state that females are graded easier and/or receive more downs before being attrited. Another 25 suggest that there is more than one set of performance standards in flight training.

ANALYSIS OF VARIANCE OF PILOT TOTAL FLIGHT HOURS

<u>SOURCE</u>	<u>DF</u>	<u>SS</u>	<u>MS</u>	<u>F</u>	<u>p</u>
ind	3	20051	6684	1.62	0.184
ERROR	1357	5606465	4132		
TOTAL	1360	5626516			

<u>LEVEL</u>	<u>N</u>	<u>MEAN</u>	<u>STDEV</u>
BLACK MALE	29	240.00	31.11
HISPANIC MALE	11	235.09	27.96
WHITE MALE	1283	246.34	61.96
FEMALE	38	267.91	32.50

INDIVIDUAL 95% CI'S FOR MEAN BASED ON POOLED STDEV OF 60.21

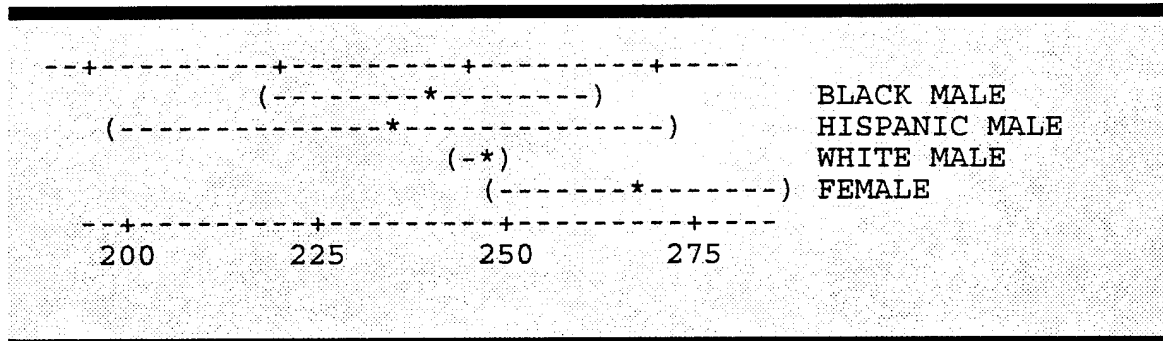


Figure 8. Pilot Total Flight Hours



ANALYSIS OF VARIANCE ON NFO PRIMARY FLIGHT HOURS

<u>SOURCE</u>	<u>DF</u>	<u>SS</u>	<u>MS</u>	<u>F</u>	<u>P</u>
ind	3	763	254	1.25	0.292
ERROR	366	74652	204		
TOTAL	369	75415			

<u>LEVEL</u>	<u>N</u>	<u>MEAN</u>	<u>STDEV</u>
BLACK MALE	27	51.17	11.42
HISPANIC MALE	14	44.42	17.50
WHITE MALE	321	45.79	14.33
FEMALE	8	45.75	15.18

INDIVIDUAL 95% CI'S FOR MEAN BASED ON POOLED STDEV of 14.20

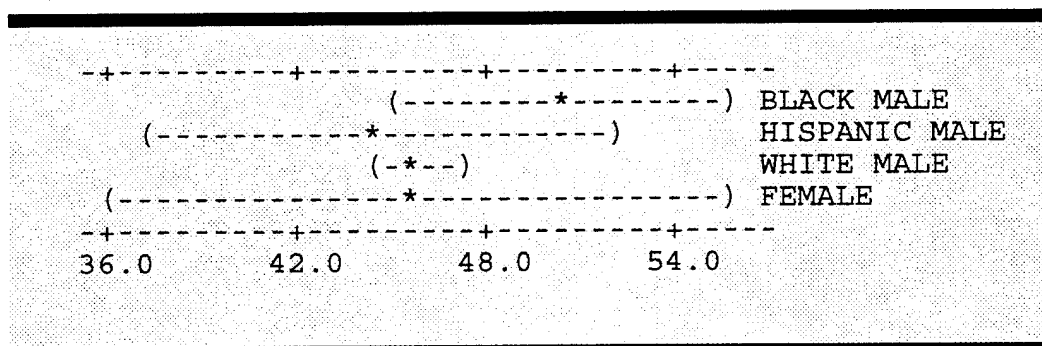


Figure 9. NFO Primary Flight Hours

ANALYSIS OF VARIANCE ON NFO TOTAL FLIGHT HOURS

<u>SOURCE</u>	<u>DF</u>	<u>SS</u>	<u>MS</u>	<u>F</u>	<u>p</u>
ind	3	3381	1127	0.94	0.419
ERROR	366	437028	1194		
TOTAL	369	440410			

<u>LEVEL</u>	<u>N</u>	<u>MEAN</u>	<u>STDEV</u>
BLACK MALE	27	109.5	29.28
HISPANIC MALE	14	104.7	43.99
WHITE MALE	321	111.1	34.60
FEMALE	8	91.9	30.64

INDIVIDUAL 95% CI'S FOR MEAN BASED ON POOLED STDEV of 34.56

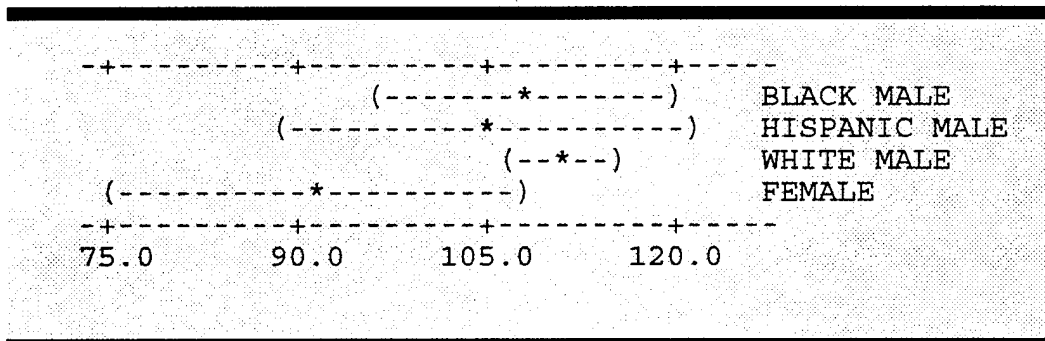


Figure 10. NFO Total Flight Hours

ANALYSIS OF VARIANCE OF THE NUMBER OF PILOT PRIMARY  
INSTRUCTIONAL FLIGHTS

<u>SOURCE</u>	<u>DF</u>	<u>SS</u>	<u>MS</u>	<u>F</u>	<u>p</u>
ind	3	318.0	106.0	3.60	0.013
ERROR	1357	39947.4	29.4		
TOTAL	1360	40265.4			

<u>LEVEL</u>	<u>N</u>	<u>MEAN</u>	<u>STDEV</u>
BLACK MALE	29	45.897	5.697
HISPANIC MALE	11	43.818	3.737
WHITE MALE	1283	43.661	5.435
FEMALE	38	45.895	5.260

INDIVIDUAL 95% CI'S FOR MEAN BASED ON POOLED STDEV OF 5.426

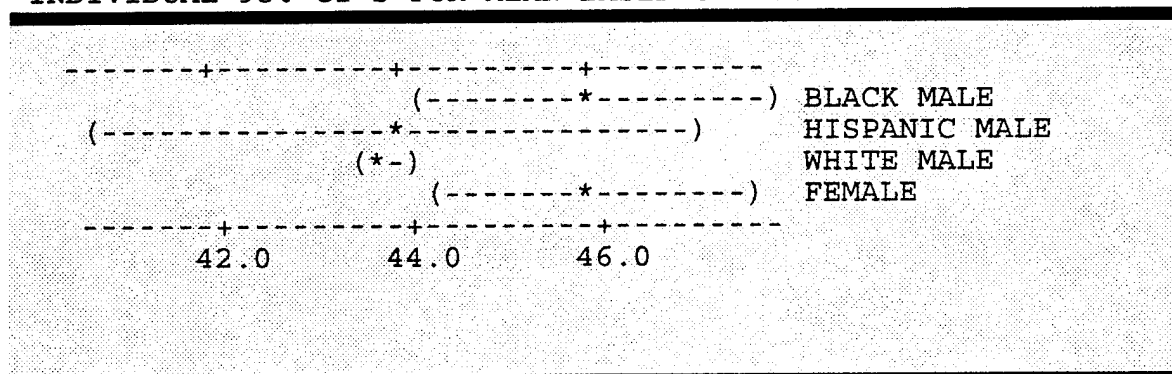


Figure 11. Pilot Primary Instructional Flights

flights. The F statistic equals 3.60, which yields a p-value of .013. Thus, there is evidence at the .05 level of significance that at least one of the means is not equal to the others.

Again pairwise comparisons using the standard normal test for comparing sample means are employed to determine the pairs of groups with a significant difference in means. Table 10 shows the results of this analysis. It is concluded that the only significant differences are found between white male and female students, with female students receiving significantly more instructional flights than white males.

**TABLE 10. PAIRWISE MEAN COMPARISON FOR PILOT PRIMARY INSTRUCTIONAL FLIGHTS**

Pair	Mean	Standard Deviation	Z Stat-istic	p-value	Reject/ Accept
Black Male-Hispanic Male	45.9 43.8	5.7 3.7	1.14	.127	Accept
Black Male-White Male	45.9 43.7	5.7 5.4	2.19	.014	Accept
Female-Hispanic Male	45.9 43.8	5.3 3.7	1.20	.115	Accept
Female-White Male	45.9 43.7	5.3 5.4	2.51	.006	Reject
Female-Black Male	45.9 45.9	5.7 5.3	.01	.496	Accept
White Male-Hispanic Male	43.7 43.8	5.4 3.7	.14	.448	Accept

Figure 12 displays the results of the ANOVA which compares the total instructional flights received for each of

ANALYSIS OF VARIANCE OF THE NUMBER OF PILOT TOTAL INSTRUCTIONAL FLIGHTS

<u>SOURCE</u>	<u>DF</u>	<u>SS</u>	<u>MS</u>	<u>F</u>	<u>P</u>
ind	3	3630	1210	0.80	0.492
ERROR	1357	2042774	1505		
TOTAL	1360	2046404			

<u>LEVEL</u>	<u>N</u>	<u>MEAN</u>	<u>STDEV</u>
BLACK MALES	29	140.66	31.92
HISPANIC MALES	11	135.36	28.79
WHITE MALES	1283	146.66	39.28
FEMALES	38	140.63	27.43

INDIVIDUAL 95% CI'S FOR MEAN BASED ON POOLED STDEV OF 38.80

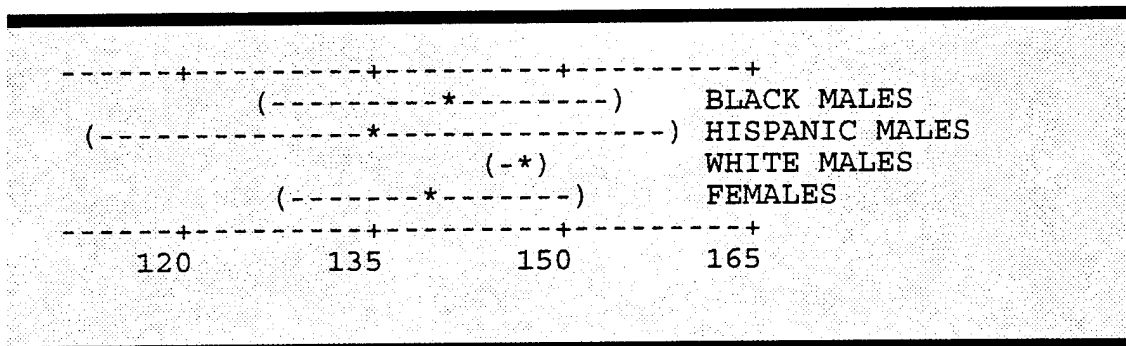


Figure 12. Pilot Total Instructional Flights

the student pilot groups. Note the F statistic is 0.80 and the p-value is .492, so there is insufficient evidence to reject the null hypothesis that there is no difference in the mean total instructional flights among the pilot student groups.

Figure 13 and 14 show the ANOVA procedures performed on the Primary phase and total instructional flights received by the NFO student groups. In both cases the F statistics are low and the p-values high (.112 and .487 respectively), so there is insufficient evidence to reject the null hypothesis that there is no significant difference in the number of instructional flights received in the Primary phase and the overall flight program for any NFO student group.

### C. OPINION SURVEY ANALYSIS

The remaining three measures suggested for double standard analysis are the "average number of warmup flights", "average number of Extra Time flights per an Unsatisfactory grade", and the "average number of downs per attrite" for each student group. The NAOMI database does not include these data, but the opinion survey provides an alternative source of information about bias as a substitute.

Nonparametric statistical tools are employed to analyze the opinion survey. Because the survey also solicits responses in other areas of potential bias, additional analysis of those issues is included.

ANALYSIS OF VARIANCE OF THE NUMBER OF NFO PRIMARY  
INSTRUCTIONAL FLIGHTS

<u>SOURCE</u>	<u>DF</u>	<u>SS</u>	<u>MS</u>	<u>F</u>	<u>p</u>
ind	3	353.6	117.9	2.01	0.112
ERROR	366	21482.4	58.7		
TOTAL	369	21836.0			

<u>LEVEL</u>	<u>N</u>	<u>MEAN</u>	<u>STDEV</u>
BLACK MALE	27	27.963	6.785
HISPANIC MALE	14	22.786	9.074
FEMALE	8	24.125	8.459
WHITE MALE	321	24.505	7.647

INDIVIDUAL 95% CI'S FOR MEAN BASED ON POOLED STDEV OF 7.661

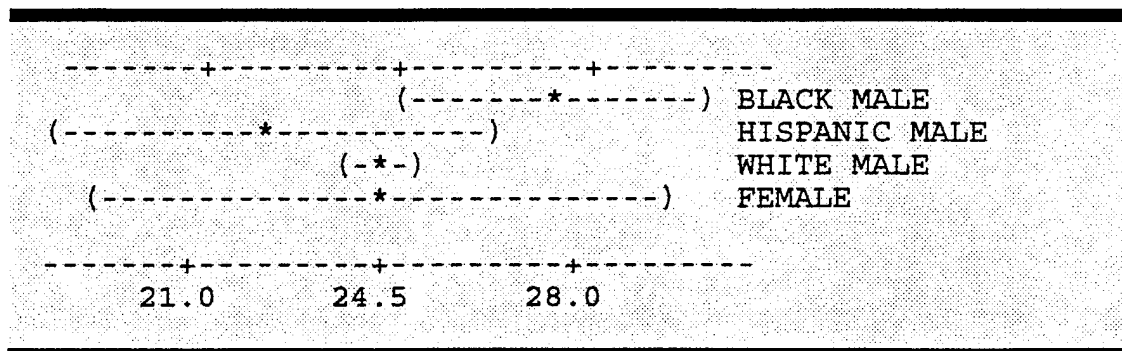


Figure 13. NFO Primary Instructional Events

# ANALYSIS OF VARIANCE OF THE NUMBER OF NFO TOTAL FLIGHT EVENTS

<u>SOURCE</u>	<u>DF</u>	<u>SS</u>	<u>MS</u>	<u>F</u>	<u>p</u>
ind	3	384	128	0.81	0.487
ERROR	366	57611	157		
TOTAL	369	57995			

<u>LEVEL</u>	<u>N</u>	<u>MEAN</u>	<u>STDEV</u>
BLACK MALE	27	50.11	10.53
HISPANIC MALE	14	46.14	16.82
WHITE MALE	321	49.65	12.51
FEMALE	8	44.38	11.72

INDIVIDUAL 95% CI'S FOR MEAN BASED ON POOLED STDEV OF 12.55

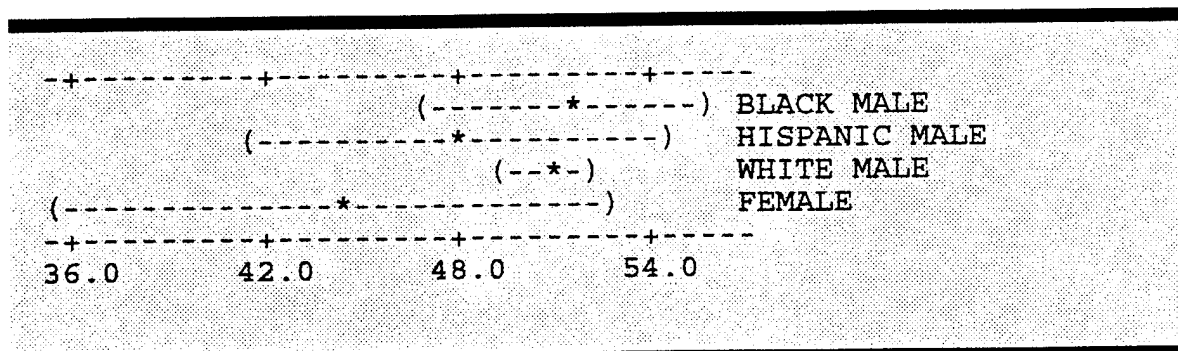


Figure 14. NFO Total Instructional Flights



## **1. Average Number of ETs and Warm Ups**

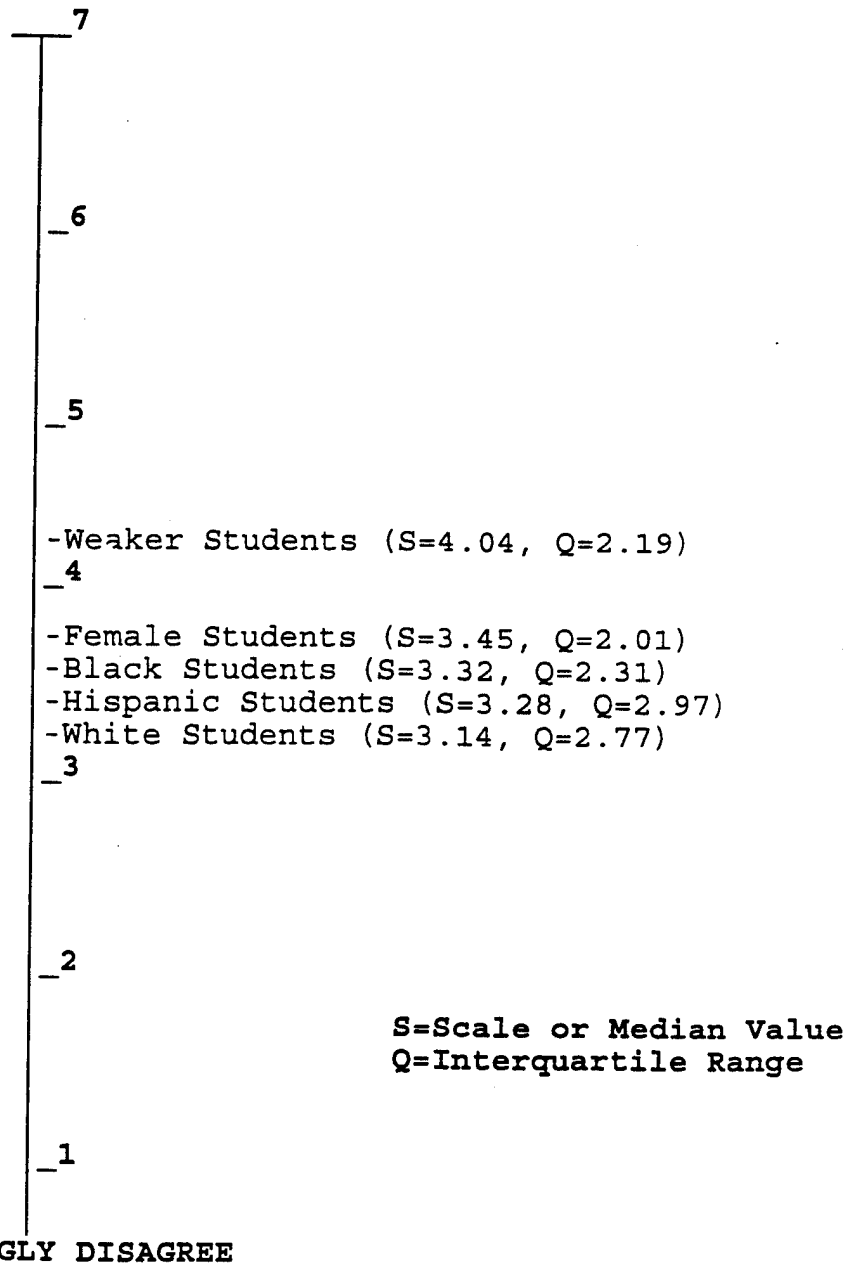
The number of warm up flights and the number of extra time flights are analyzed together because they are combined on the actual survey. These specific measures are addressed in the survey with the statement, *"This student group is awarded more warm-ups and ETs."* The groups compared are white, black, Hispanic, female, and weaker students. Figure 15 displays the scale value and interquartile range for the responses on the seven point scale.

A Friedman test for randomized block design is used to test the hypothesis that the population distribution of the responses are identical. The five comparison groups serve as treatments and the 250 survey responses serve as blocks. The test confirms the absence of significant differences between any of the respondents (Chi-squared statistic = 3.60, degrees of freedom = 4, p-value = .45).

## **2. Average Number of Unsat Grades Before Attrition**

This measure is addressed in the survey with the statement, *"This student group gets more downs before being attrited."* Figure 16 displays the scale values and interquartile ranges for this issue on the seven point scale. Again the Friedman test for randomized block design is employed, with the same treatments and blocks. The test confirms the absence of significant differences between any of the groups (Chi-squared test statistic = 6.40, degrees of freedom = 4, p-value = .14).

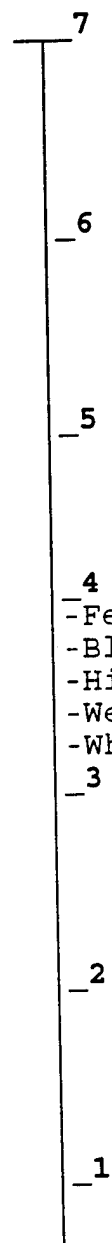
STRONGLY AGREE



*"The student group is awarded more warm-ups and ETs"*

Figure 15. Statement Response Scale

STRONGLY AGREE



-Females Students (S=3.75, Q=2.15)  
-Black Students (S=3.60, Q=2.51)  
-Hispanic Students (S=3.37, Q=2.30)  
-Weaker Students (S=3.30, Q=2.25)  
-White Students (S=3.10, Q=2.70)

S=Scale or Median Value  
Q=Interquartile Range

STRONGLY DISAGREE

*"The student group gets more downs before being attrited"*

Figure 16. Statement Response Scale

### 3. Additional Analysis

The analyses of the survey responses above provide the information necessary to address the measures of double standard bias posed earlier in this chapter. The survey solicits responses in other areas as well, and the following sections highlight the pertinent results.

#### a. *Black and white responses to racial issues*

Survey statements one, two, four, seven, and eight address racial bias or discrimination issues. Agreement with statements one and two shows the Navy in a positive light, where as agreement with statements four, seven, and eight show the Navy in a negative light. To make consistent comparisons, the responses for statements four, seven, and eight are reflected about the neutral point on the scale (4.0). Figure 17 shows the black and white student group responses to the statements on the seven point scale before the reflection procedure. Table 11 aggregates the category responses over the five applicable statements.

TABLE 11. SUMMARY OF BLACK AND WHITE RESPONSES TO RACIAL ISSUE STATEMENTS (1, 2, 4, 7, AND 8)

Category								
Race	1	2	3	4	5	6	7	Total
Black	8	16	14	27	13	8	5	91
White	19	15	54	164	191	230	351	1034

To determine if blacks and whites view racial issues similarly, the distribution of their aggregate

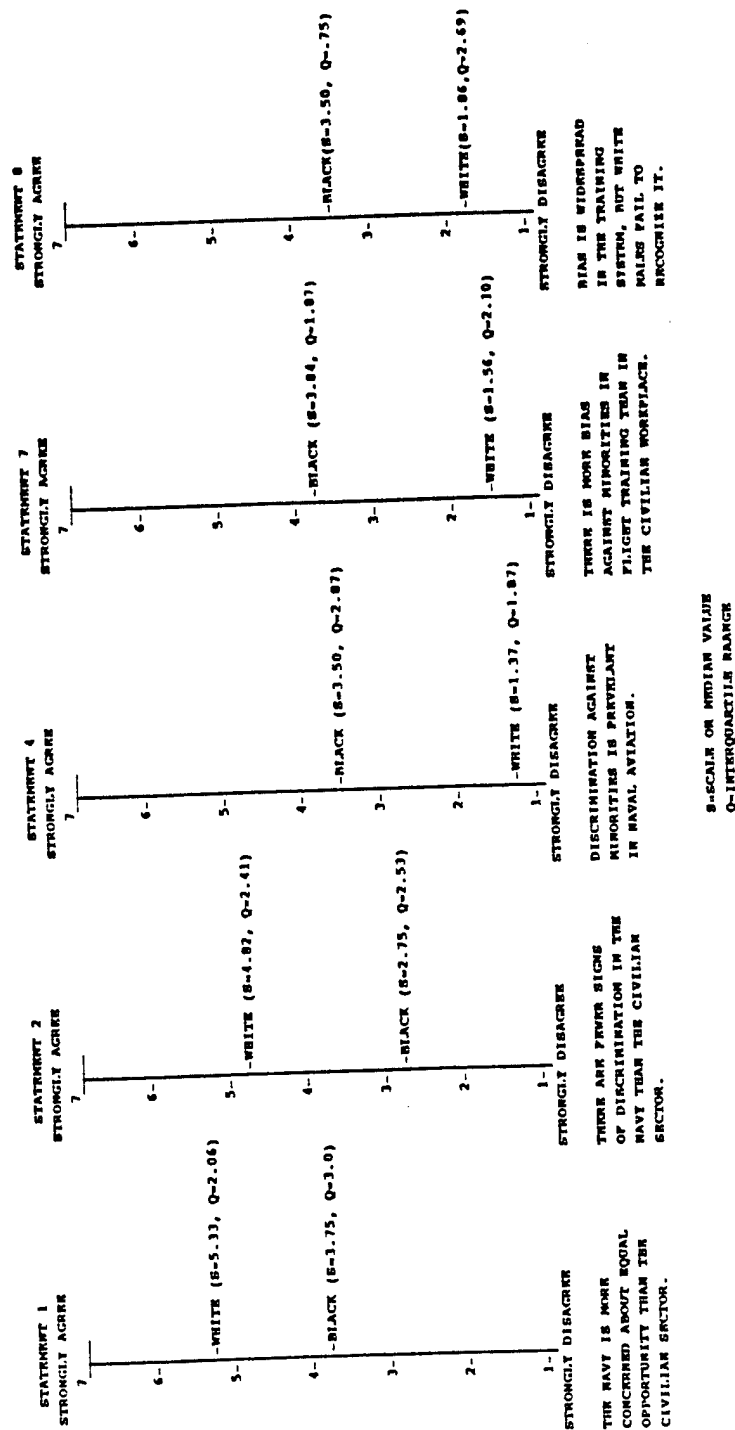


Figure 17. Black and White Responses to Racial Issues

responses are compared using a 2 x 7 contingency table. The contingency test rejects the null hypothesis that the expected distributions are identical, confirming that black responses are significantly more in agreement that racial bias does exist in Naval Aviation flight training than the white respondents. (Chi-squared test statistic = 149.8, critical value = 12.59, Degrees of freedom = 6, p-value = 0).

**b. Male/female responses to statements on gender bias**

Analysis similar to that conducted in section (a)<sup>10</sup> is employed for comparing female and male responses to three statements that address gender bias. Statement three is reflected to match polarity with statements five and six. Figure 18 shows the male and female responses to the statements on the seven point scale. Table 12 sums the category responses.

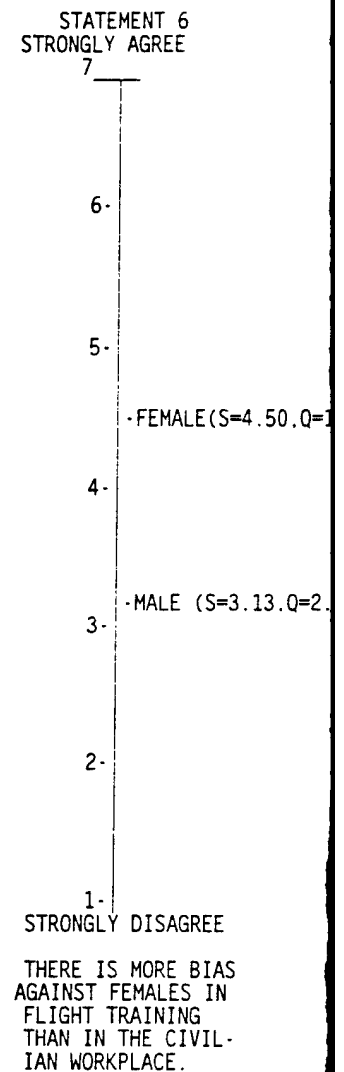
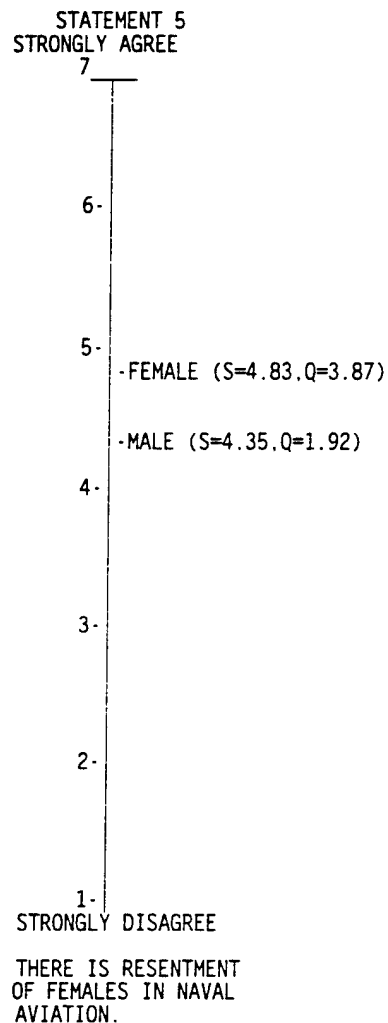
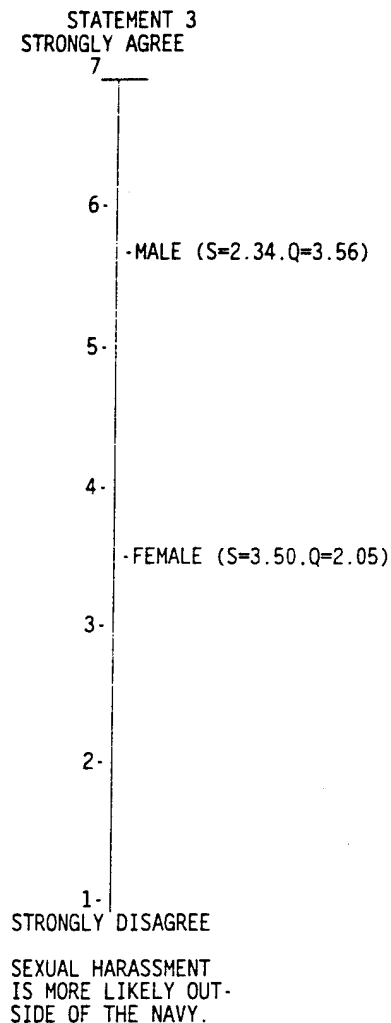
**TABLE 12. SUMMARY OF FEMALE AND MALE RESPONSES TO GENDER ISSUE STATEMENTS (3, 5, AND 6)**

Category							
Group	1	2	3	4	5	6-7	Total
Female	2	2	1	10	8	10	33
Male	140	88	96	146	135	108	713

The contingency test rejects the null hypothesis that the expected distributions are identical, confirming that female responses are significantly more in agreement that

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<sup>10</sup>Response categories six and seven are combined so that the expected cell entry for females exceeds five.



S=SCALE OR MEDIAN VALUE  
Q=INTERQUARTILE RANGE

Figure 18. Male and Female Responses to Statements Concerning Gender Bias

gender bias does exist in Naval Aviation flight training than the male respondents. (Chi-squared test statistic = 13.41, critical value = 11.07, degrees of freedom = 5, p-value = .02).

**c. Primary/intermediate/advance stage responses**

The median responses to survey statements one through ten for the Primary, Intermediate, and Advanced stage students are analyzed to determine if perceptions of race and gender bias change as flight students progress from the Primary to the Advanced training phases. To ensure consistent comparisons, the medians for statements four through eight are reflected about the neutral point on the scale (4.0).

A Friedman test for randomized block design, using the three training phases as treatments and blocking on the seven response categories, confirms the absence of significant differences between the responses of the Primary, Intermediate, and Advanced flight students. (Chi-squared test statistic = 1.90, degrees of freedom = 2, p-value = .55).

**d. Student and instructor response comparison**

To determine if students and instructors view racial and gender bias issues similarly, the distribution of their responses to each of the first nine statements in survey section two are compared using a 2 x 6 contingency table. The results of the nine calculations show that there is insufficient evidence to suggest any difference in the responses of the students and instructors. For example, in statement one the test statistic is 9.11, while the chi



squared critical value with five degrees of freedom is 11.07. The remaining eight calculations yield similar results. Statement ten is not analyzed since it considers instructor grading fairness.

However, instructor response distributions differed significantly for some statements in section one of the survey. In particular instructors disagreed strongly with the statement, "*White students are awarded more warm ups and ETs,*" with a median response of 1.61 versus the student median response of 3.23. Also, the instructors disagreed very strongly (median equals 0.97) to the statement, "*White students get more downs before being attrited,*" versus a median response of 3.10 for the students.

## **V. CONCLUSIONS**

### **A. SUMMARY**

The null hypothesis of this study is that no bias exists in Naval Aviation flight training. The statistical analyses results fail to show conclusive evidence to reject this hypothesis, although some results do indicate areas of possible bias.

In the first area of study, differences in student group flight program success rates are analyzed. Significant differences exist between student groups in these rates. Hispanic and black students have a 20 percent lower program success rate and women have a 15 percent lower success rate than their white male counterparts. Using the available NAOMI database, logistic regression models are used to try to explain these success rate differences. These models are unsuccessful, as the logistic regression models explain only 10 percent of the performance deviations. More data is needed to improve these models' predictive power and determine if bias is indicated as a causal factor in the success rate differences.

Pilot pipeline selection rate differences are also analyzed. Using multiple regression a stronger relationship between the dependent variable, primary flight grade, and the set of independent variables is found, with 45 percent of the

variation being explained. This model provides an exception to the study conclusions. The black indicator variable is significant, with the expected grade of black student pilots, given all other modeled factors equal, being three points less than their white counterparts. This is enough to make a difference in pipeline selection.

Double standard issues are addressed last. Analysis of variance of the student data and nonparametric analysis of the survey results reveals little to suggest any inference of double standard bias. Female student pilots in the Primary flight phase do receive greater flight time and instructional hops than their white male counterparts, though this difference may be attributable to their lower average primary flight grades that necessitates more instruction.

Before dismissing the concept of bias in Naval Aviation flight training, it is important to note the body of contradictory evidence that may indicate possible bias. For example, though the logistic regression models are poor in explanatory power, both race and gender are significant variables in those models. This could suggest a potential association between race and/or gender and lower performance, and is worthy of further study. The finding of the multiple regression model that black students' expected grades are lower also suggests a possible association with bias.

The nonparametric analyses results are also pertinent. While survey results, because of their subjective nature, do

not infer bias, they do suggest perceptions of bias. For example, black survey respondents felt that racial bias exists in Naval Aviation flight training significantly more than white respondents. Similarly, female respondents felt that gender bias exists in Naval Aviation flight training significantly more than the male respondents.

Finally, a sizeable 54 percent of the written survey comments suggest that there exists a double standard bias in grading in favor of minority and female students. However, a majority of written responses from black students (57 percent) thought that there is grading bias against black students.

## **B. CONCLUSIONS**

The null hypothesis that Naval Aviation flight training is bias free has not been clearly rejected in a statistical sense. Still, the Navy should not be satisfied with the study results. The inadequacy of the models in explaining performance deviations suggest that it may be premature to assume that bias does not exist in flight training. Bias may indeed exist, it just may not be clearly indicated in the models. Incorporating other potential measures associated with flight school success would improve model predictive power and explore questions of bias more thoroughly.

The exceptions to the statistical analyses noted above and the indications of perceived bias generated in the survey are also areas of concern. This is especially true in light of

the many programs already in place to ensure equal opportunity in Naval Aviation flight training<sup>11</sup>.

The following areas for future research are needed to provide additional description of potential problems of bias in Naval Aviation flight training, as well as render a basis to evaluate the usefulness of recently implemented training command policies.

- \* Measure time to train in each stage, which offers an opportunity to check for possible schedule bias. This would be most effective if the researcher is able to account for delays such as weather, waiting pools, and unexpected aircraft grounding.
- \* Reanalyze minority pipeline selection performance since new CNATRA policy excludes the grades of the first five Familiarization flights for pipeline selection criteria.
- \* Analyze multiple regression model with motor skill prediction factors. The potential advantages have been previously discussed.
- \* Readminister the survey after two years have elapsed to determine whether the perceptions of bias in Naval Aviation flight training have changed. This provides an excellent management and analytical feedback tool.
- \* Quantify and incorporate extra time flights, unsatisfactory grades, and warmup flight totals into the NAOMI database.

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<sup>11</sup> The Navy has aggressively introduced various initiatives to facilitate an equal opportunity atmosphere in flight training. Below are listed several example programs:

- \* Tutoring for students with weak mathematical college backgrounds.
- \* Minority student mentor program, where a minority flight instructor is assigned to minority students to help ease their introduction into the Naval Aviation culture.
- \* A buddy system, where minority students always have at least one other minority student in their AOCS class or primary stage class, etc.

The mission of Naval Aviation flight training is to train the finest pilots in the world, regardless of gender, race, or creed. Standards exist to ensure that this mission is fulfilled. Bias in any form can have an adverse effect on these standards as well as fleet aviator quality, unit morale, and combat readiness. The following comments from an Intermediate stage student summarizes this sentiment:

If anything can be done to increase the number of minorities and women, it would be to bring in more qualified candidates. What Naval Aviation cannot afford is to change standards to make a quick fix to equalize the number of students. This disparity cannot be corrected quickly ...needs to be a gradual process. The worst situation ...where grades are given on an uneven basis...will lead to dangerous situations where lives are at stake. Standards cannot be lowered in this profession, because even more important than lives is our national defense.

## **APPENDIX A**

### **NAVAL AVIATION FLIGHT TRAINING**

#### **A. INITIAL TRAINING**

The initial training for the students in the Naval Aviation flight program consists of medical and academic screening, preflight indoctrination, academic classes, and military and physical instruction. Navy flight training is conducted by the Chief of Naval Air Training (CNATRA). After successful completion of all training phases, the officer is designated as a Naval Aviator or Naval Flight Officer.

There are two ways of entering flight training: as a civilian college graduate through the Aviation Officer Candidate School (AOCS) or as a commissioned officer from the Naval Academy or Navy Reserve Officer Training Course. In addition to passing medical screens and minimum education requirements, all applicants are tested with a battery of academic, mechanical, and spatial aptitude examinations. These tests are used to assess an individual's potential for success, known as "aeronautical adaptability", in the flight program (Barnes 1989, 1-6).

Training begins with aviation preflight indoctrination (API) for the previously commissioned officers and AOCS for the direct input civilians. Training includes military, physical, and academic instruction. The academic classes are

basic navigation, aerodynamics, and common aircraft power plant design. These courses each include a midterm and a final examination.

During this initial phase of instruction the most common attrition factors are failing the rigorous entrance flight physical, academic failure, and withdrawing. This final reason usually is a result of AOCS students who are not comfortable with the boot camp type atmosphere of the AOCS or who have realized that the Navy is not the lifestyle that they thought they wanted.

## B. PILOT TRAINING

There are three phases for the training of pilots: primary, intermediate, and advanced (see Figure 18). The primary phase is approximately 22 weeks long and it is here that actual flight training begins. The course length for each training phase varies frequently due to unforeseen weather and unplanned aircraft

grounding. Primary

pilot training includes several solo flights and instruction in formation and instrument flying. As the student completes the primary phase the

student pilots are

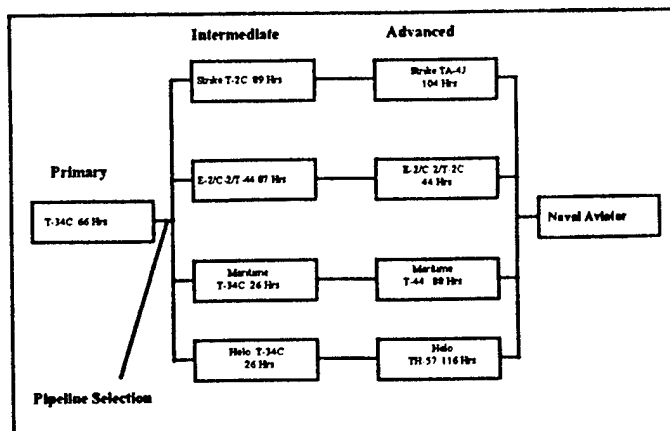


Figure 19. Pilot Training Pipeline

separated into the strike (jets), maritime (props, E-6),



helicopter, and E-2/C-2 pipelines. This selection is determined by individual student flight grades, student preferences and the needs of the Navy. Though the selection opportunities vary weekly, the overall selection averages based on annual Navy needs are 25% strike, 25% maritime, 45% helicopter, and 5% E-2/C-2.

The next phase of flight training, intermediate, ranges from less than six weeks for maritime and helicopter pilots to 25 weeks for strike and E-2/C-2 pilots. Intermediate training for strike pilots includes classroom instruction, flight simulator work, and carrier landing qualifications in addition to jet aircraft familiarization flying. Helicopter and maritime pilots gain additional navigation and radio instrument skills during their intermediate phase.

The advanced phase for strike pilots is 20 weeks long and builds on their intermediate experience, introducing tactical skills such as air to ground ordnance delivery, night formation flying, and air combat maneuvering. The advanced phase for maritime pilots is approximately 18 weeks in length and includes multi-engine training and an introduction into various low altitude surveillance techniques. Advanced helicopter training is 12 weeks long and teaches critical tactical skills: low altitude maneuvering, shipboard operations, lift techniques, and instrument hovering.

Attrition in pilot training occurs predominantly in the primary stage, since this is the first actual flying

experience for most students. Constant airsickness and loss of motivation are common attrition factors in this phase. Others are also attrited at this stage because their flying performance is so poor that further training is not warranted. Attrition in the intermediate and advanced stages is rarer, though it is not uncommon in the advanced strike phase because of the difficult challenge of carrier landing qualifications.

### C. NFO TRAINING

NFO training also consists of a primary, intermediate, and advanced stage (see Figure 20). The primary phase is 15 weeks. During this phase students are introduced to aviation both by some familiarization flying of their own and by learning basic flight officer techniques such as overland low altitude navigation, crew coordination, and radio instrument procedures.

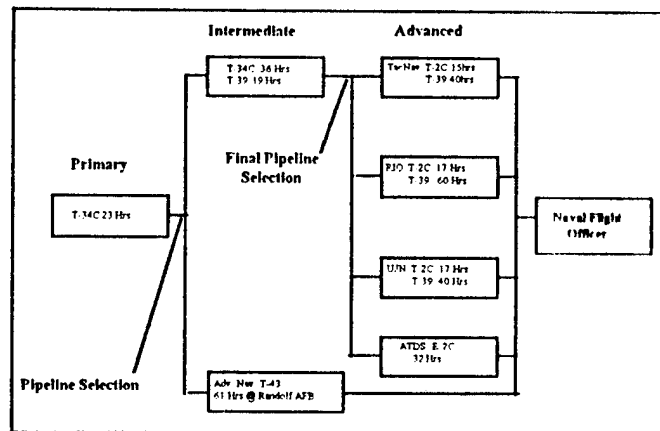


Figure 20. NFO Training Pipeline

The initial NFO selection is conducted at the conclusion of primary training, with 15% of the students being selected for maritime training and the remaining students continuing with carrier based training pipelines.

The maritime students complete their training with the Air Force and proceed to the P-3, EP-3, and E-6 communities. The

remainder continue with 13 weeks of intermediate training that reinforces their basic flight officer skills. At this point the final pipeline selection occurs. Students are assigned to the airborne tactical data system (E-2), radar intercept officer (RIO, F-14), tactical navigation (TacNav, A-6, EA-6), or over water jet navigation (OJN, S-3) pipelines.

The advanced NFO training phase lasts from 15 to 21 weeks. Each specific pipeline is designed to introduce advanced tactical flight officer capabilities while honing the basic flight officer skills. Some of these new skills include conducting radar intercepts, low level instrument navigation, and operation of a sophisticated airborne early warning net.

Like the pilots, NFO attrition occurs during the primary stage with airsickness and motivation loss as primary causal factors. Because the NFO program is more academically challenging, some additional attrition occurs from academic failures during the latter stages.

#### **D. PERFORMANCE EVALUATION**

Pilot and NFO training pipelines are building block training programs. When a student completes a phase, he or she begins the next, more specific training stage. Students who do not meet the requisite performance standards are removed (attrited) from the training pipeline.

All students are graded on every simulator and flight event. Many specific skill areas are evaluated, with the following grades assigned:

- \* Above average
- \* Average
- \* Below average
- \* Unsatisfactory (also known as an Unsat or a Down)

## **APPENDIX B**

### **GLOSSARY OF TERMS**

**AOCS**-Aviation Officer Candidate School. The starting point for direct entry civilians into flight training. It is a boot camp followed by the same academic, survival, and physical training that the other flight students receive. Upon graduation from AOCS, the candidates receive a reserve commission in the Navy.

**API**-Aviation Preflight Indoctrination. The starting point in flight training for Naval Academy and Naval Reserve Officer Training Corps graduates who are already commissioned officers. Includes academic, survival, and physical training.

**AQT**-Academic Qualification Test. Academic test administered to all flight school applicants. Administered in conjunction with the BI and FAR.

**BI**-Background Inventory. A biographical inventory of applicants designed to measure potential for success in flight training. Not the same as a Background Investigation which is used for determining security clearances.

**CNATRA**-Chief of Naval Air Training. The Flag Officer charged with the operation and administration of Naval Aviation flight training. Five Training Wing Commanders, all Captains, report to CNATRA.

**CNO**-Chief of Naval Operations. The Navy's senior uniformed leader, responsible for the training, administration, and support of the Navy.

**DOR**-Drop on Request. The term used in Naval Aviation for quitting the flight training program voluntarily.

**ETs**-Extra Time Flights. A student may be awarded one or two extra training flights after an unsatisfactory flight to attempt to return the student to the required performance level. Squadrons have some discretion as to how many ETs may be awarded, depending on the circumstances.

**FAR**-Flight Aptitude Rating. Test administered to all applicants that measures potential aviation adaptability.

**MCT**-Mechanical Comprehension Test. A subtest of the AQT.

**NAMI**-Naval Aerospace and Operational Medical Institute. Command responsible for Aviation Physiology and Aviation Psychology.

**NFO**-Naval Flight Officer. Aviation officer who operates weapons, electronics, and other airborne systems, but does not actually pilot the aircraft.

**NMPC**-Naval Military Personnel Command. Navy bureaucracy responsible for the management of the Navy's personnel resources.

**OAR**-Officer Aptitude Rating. Number that represents the sum of the total correct responses on the AQT and MCT.

**PERS-211V**-Office at NMPC responsible for the management of the aviation community officers.

**Preflight Stage**-Used to describe AOCS and API in aggregate.

**SAT**-Spatial Apperception Test. Subtest of the AQT.

**Warm up**-CNATRA instruction states that a warm up flight (ungraded) may be warranted when the student has a lapse in training due to aircraft grounding, bad weather, or other factors. Squadrons have some discretion in awarding a warm up flight.

## ***A SURVEY OF PERCEPTIONS OF BIAS IN NAVAL AVIATION FLIGHT TRAINING***

This three part survey is designed to evaluate student and instructor perceptions of bias in Naval Aviation flight training. *Part One* evaluates your perceptions regarding the extent to which five practices may impact the progress of various student subsets. *Part Two* assesses topics which bear on possible differential treatment. *Part Three* requests general background information. This survey is designed to be completed in about 5 - 10 minutes.

***PART 1.*** The following matrix lists five practices across the top with a *seven point rating scale* depicting the extent to which you *disagree or agree* that these practices occur in the *five student groups* listed at the far left column. For each seven-point rating scale, circling a "1" indicates you ***STRONGLY DISAGREE***, circling a "4" indicates you have a ***NEUTRAL OPINION***, and circling a "7" indicates you ***STRONGLY AGREE*** that the practice occurs.

Mark the place on the rating scales for each practice that best conveys *your perception* that these practices occur in the five different student groups. *Written comments are solicited and will be added to the survey results.*

***This student group:***

<b><i>Student Group</i></b>	<b><i>is awarded more warm-ups and ETs.</i></b>	<b><i>is scheduled on a more regular basis.</i></b>	<b><i>is graded harder.</i></b>	<b><i>gets more downs before being attrited.</i></b>	<b><i>receives special treatment.</i></b>
<b><i>White</i></b>	1-2-3-4-5-6-7	1-2-3-4-5-6-7	1-2-3-4-5-6-7	1-2-3-4-5-6-7	1-2-3-4-5-6-7
<b><i>Black</i></b>	1-2-3-4-5-6-7	1-2-3-4-5-6-7	1-2-3-4-5-6-7	1-2-3-4-5-6-7	1-2-3-4-5-6-7
<b><i>Hispanic</i></b>	1-2-3-4-5-6-7	1-2-3-4-5-6-7	1-2-3-4-5-6-7	1-2-3-4-5-6-7	1-2-3-4-5-6-7
<b><i>Female</i></b>	1-2-3-4-5-6-7	1-2-3-4-5-6-7	1-2-3-4-5-6-7	1-2-3-4-5-6-7	1-2-3-4-5-6-7
<b><i>Weaker Students</i></b>	1-2-3-4-5-6-7	1-2-3-4-5-6-7	1-2-3-4-5-6-7	1-2-3-4-5-6-7	1-2-3-4-5-6-7

APPENDIX C  
OPINION SURVEY

**PART 2.** For each of the following statements, indicate your opinion by marking the place on the rating scale that corresponds with how you feel. Again, written comments are encouraged.

**1. The Navy is more concerned about equal opportunity than the civilian sector.**

Strongly Disagree ——— Neutral ——— Strongly Agree

**2. There are fewer signs of discrimination in the Navy than the civilian sector.**

Strongly Disagree ——— Neutral ——— Strongly Agree

**3. Sexual harrassment is more likely outside of the Navy.**

Strongly Disagree ——— Neutral ——— Strongly Agree

**4. Discrimination against minorities is prevalent in Naval Aviation.**

Strongly Disagree ——— Neutral ——— Strongly Agree

**5. There is resentment of females in Naval Aviation.**

Strongly Disagree ——— Neutral ——— Strongly Agree

**6. There is more bias against females in flight training than in the civilian workplace.**

Strongly Disagree ——— Neutral ——— Strongly Agree

**7. There is more bias against minorities in flight training than in the civilian workplace.**

Strongly Disagree ——— Neutral ——— Strongly Agree

**8. Bias is widespread in the training system, but white males fail to recognize it.**

Strongly Disagree ——— Neutral ——— Strongly Agree

**9. The Naval Aviation Training Command works hard to ensure everyone gets the same opportunity.**

Strongly Disagree ——— Neutral ——— Strongly Agree

**10. I feel that my instructors are usually quite fair to me.**

Strongly Disagree ——— Neutral ——— Strongly Agree



**PART 3.** Please provide the following Background Information by checking the appropriate line.

**Status:**

☐ Student, Schools Command  
☐ Student, Primary  
☐ Student, Intermediate  
☐ Student, Advanced  
☐ Instructor

**Race/Ethnic Background:**

☐ White  
☐ Black  
☐ Hispanic  
☐ Other

**Sex:**

☐ Female  
☐ Male

**Pipeline:**

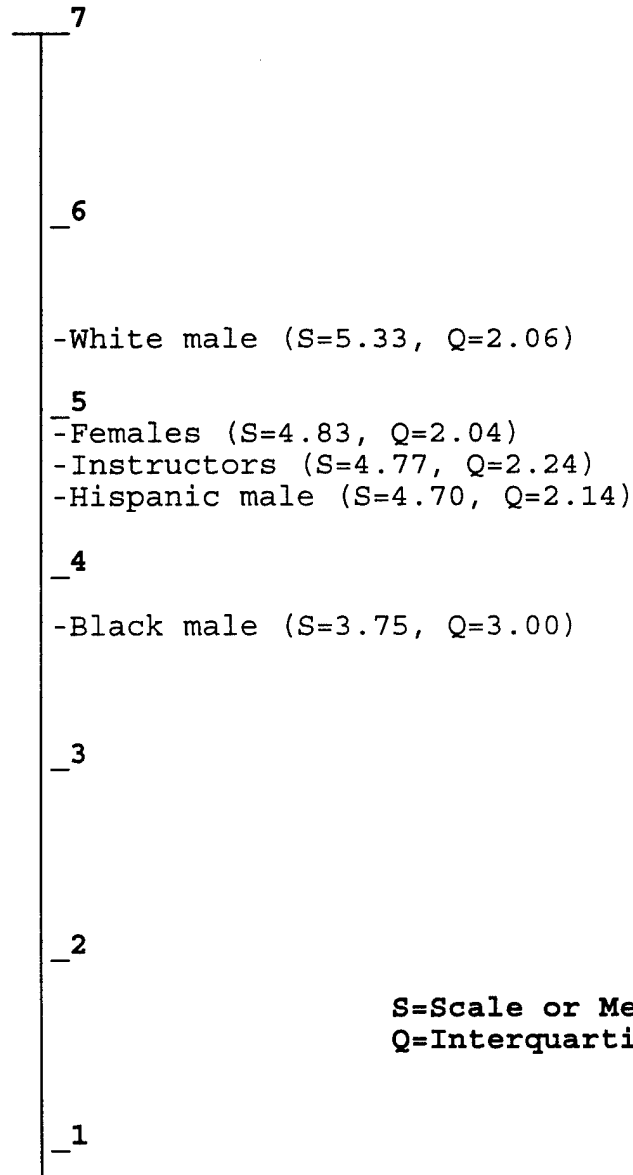
☐ Strike ☐ RIO  
☐ Maritime ☐ B/N  
☐ E-2/C-2 ☐ EA-6  
☐ Helicopter ☐ S-3

**Crew Position:** ☐ Pilot ☐ Naval Flight Officer ☐ Other

**Written Comments.**

APPENDIX D  
STATEMENT 1

STRONGLY AGREE



STRONGLY DISAGREE

*"The Navy is more concerned about equal opportunity than the civilian sector"*

STATEMENT 2

STRONGLY AGREE



-Hispanic male (S=4.70, Q=2.14)

-Females (S=4.83, Q=2.04)  
-White male (S=4.82, Q=2.41)  
-Instructors (S=4.48, Q=2.26)

-Black male (S=2.75, Q=2.53)

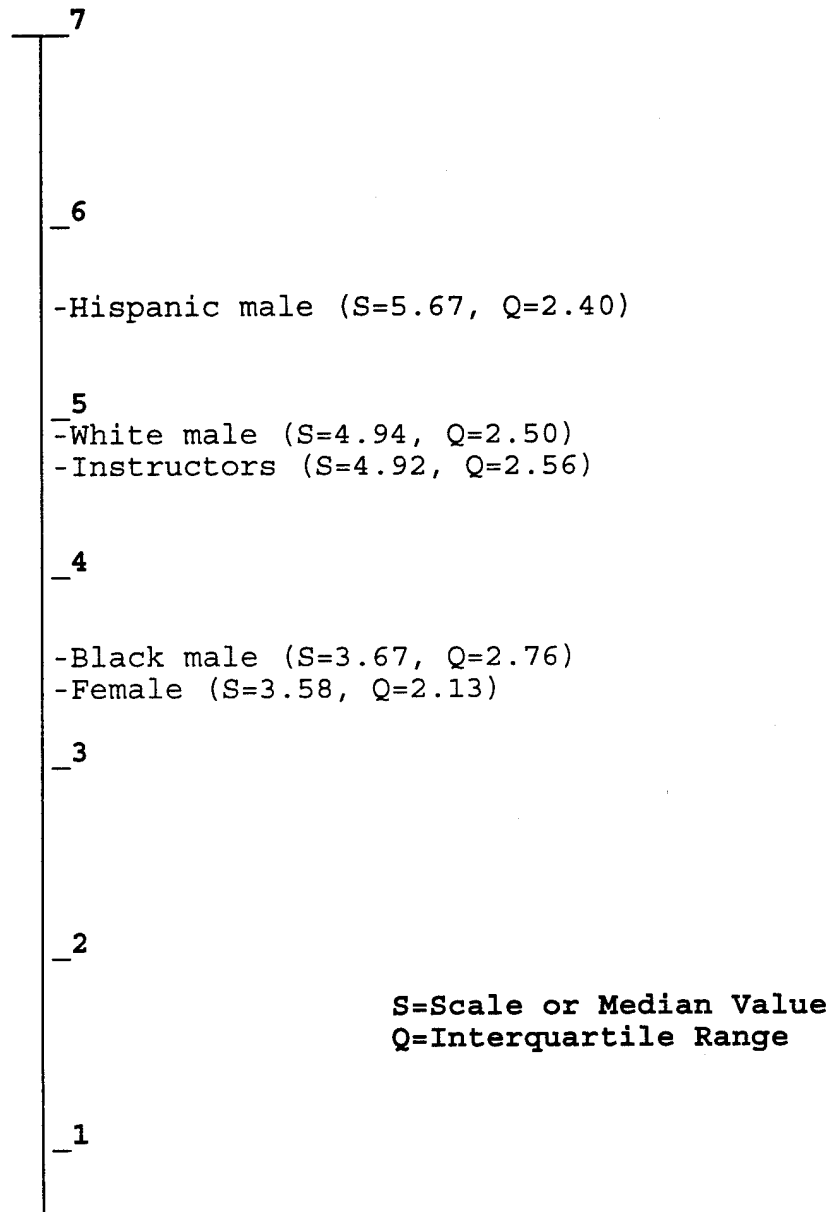
S=Scale or Median Value  
Q=Interquartile Range

STRONGLY DISAGREE

*"There are fewer signs of discrimination in the Navy than the civilian sector"*

STATEMENT 3

STRONGLY AGREE

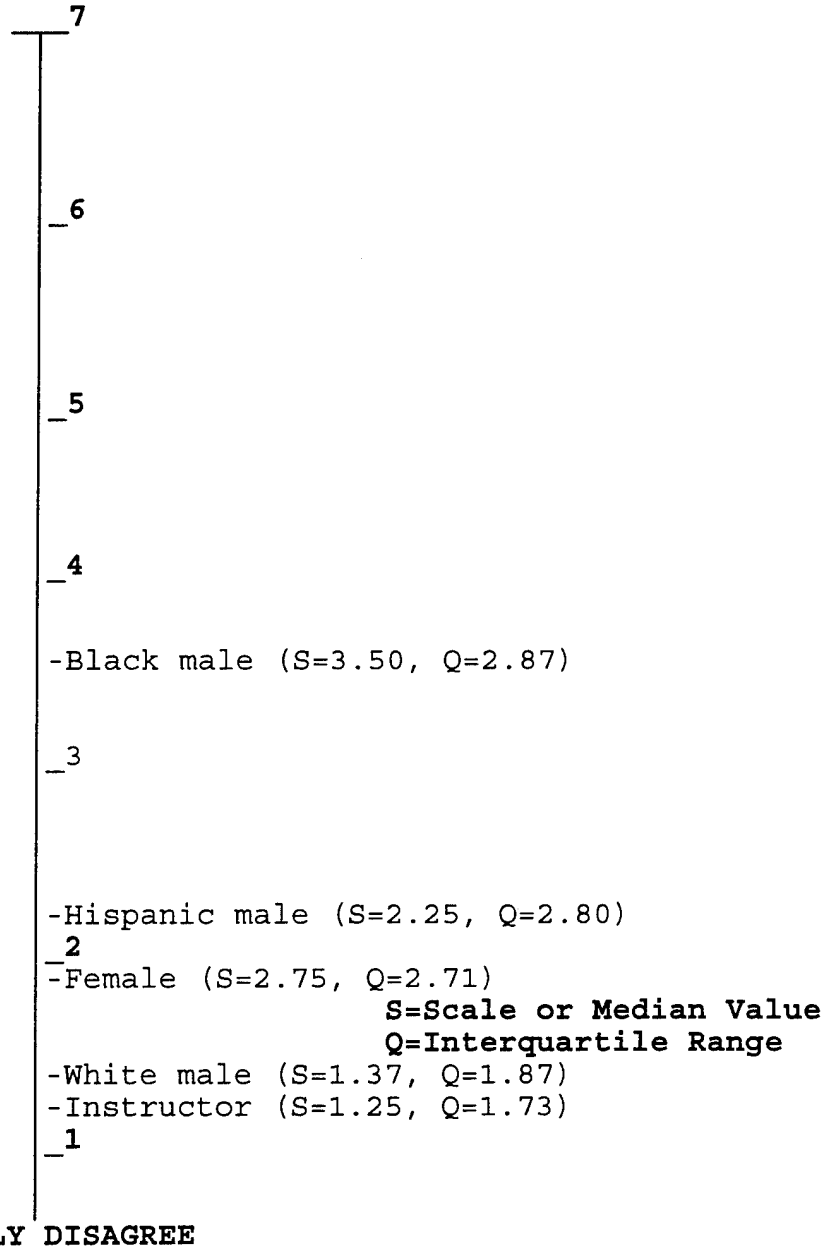


STRONGLY DISAGREE

*"Sexual harrassment is more likely outside of the Navy"*

STATEMENT 4

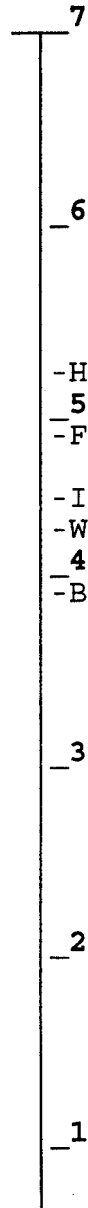
STRONGLY AGREE



"Discrimination against minorities is prevalent in Naval Aviation"

STATEMENT 5

STRONGLY AGREE



-Hispanic male (S=5.10, Q=2.50)

-Females (S=4.83, Q=1.69)

-Instructor (S=4.40, Q=1.80)

-White male (S=4.34, Q=1.91)

-Black male (S=3.80, Q=3.57)

S=Scale or Median Value  
Q=Interquartile Range

STRONGLY DISAGREE

*"There is resentment of females in Naval Aviation"*

STATEMENT 6

STRONGLY AGREE

7

6

5

-Female (S=4.50, Q=1.21)

4

-Black male (S=3.71, Q=1.77)

-Hispanic male (S=3.63, Q=2.63)

3

-White male (S=2.97, Q=3.03)

-Instructor (S=2.70, Q=2.98)

2

S=Scale or Median Value  
Q=Interquartile Range

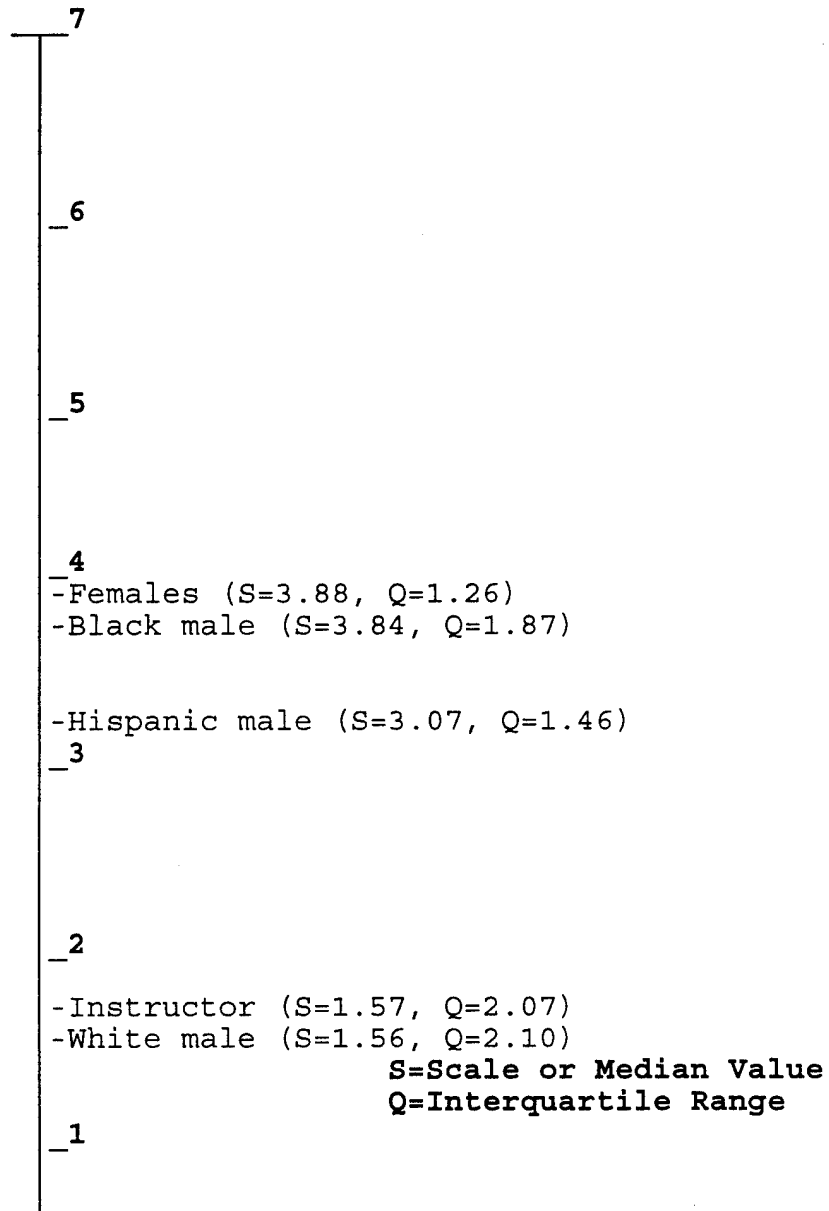
1

STRONGLY DISAGREE

*"There is more bias against females in flight training than in the civilian workplace"*

STATEMENT 7

STRONGLY AGREE



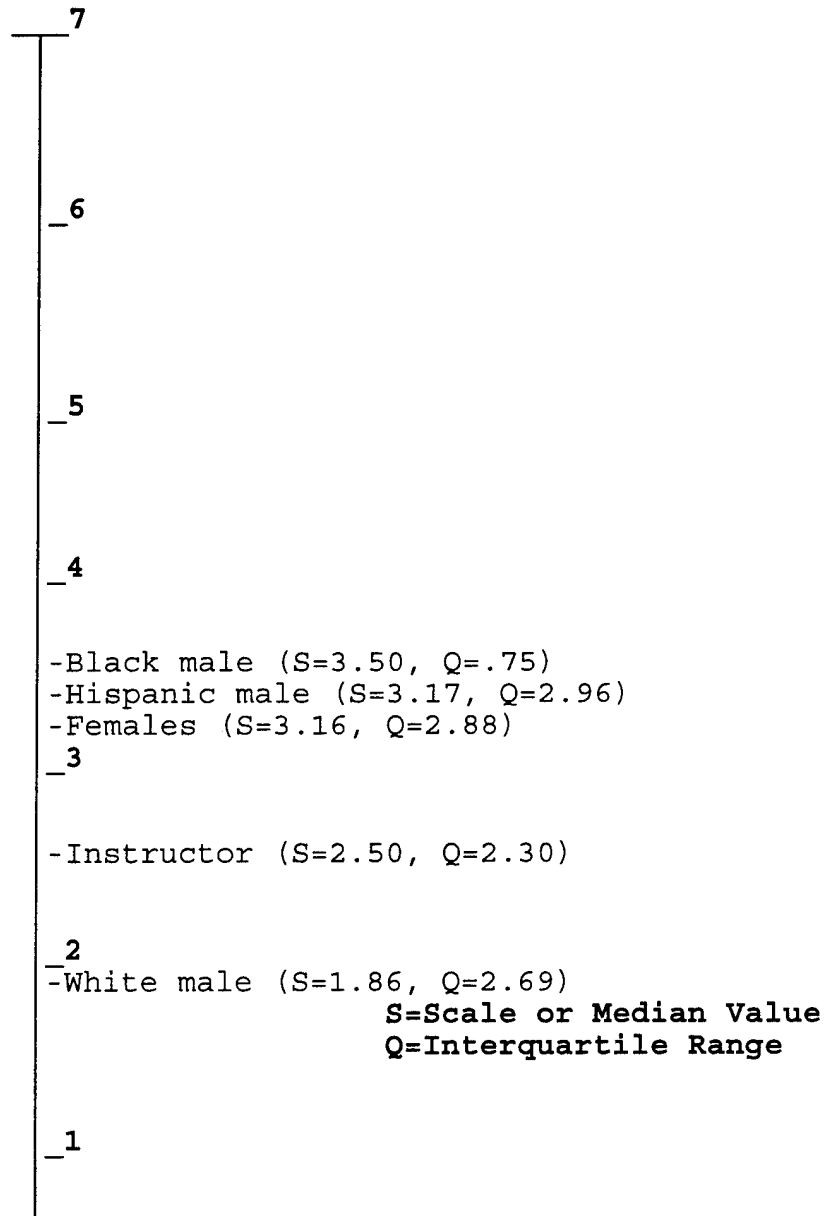
STRONGLY DISAGREE

*"There is more bias against minorities in flight training than in the civilian workplace"*



STATEMENT 8

STRONGLY AGREE

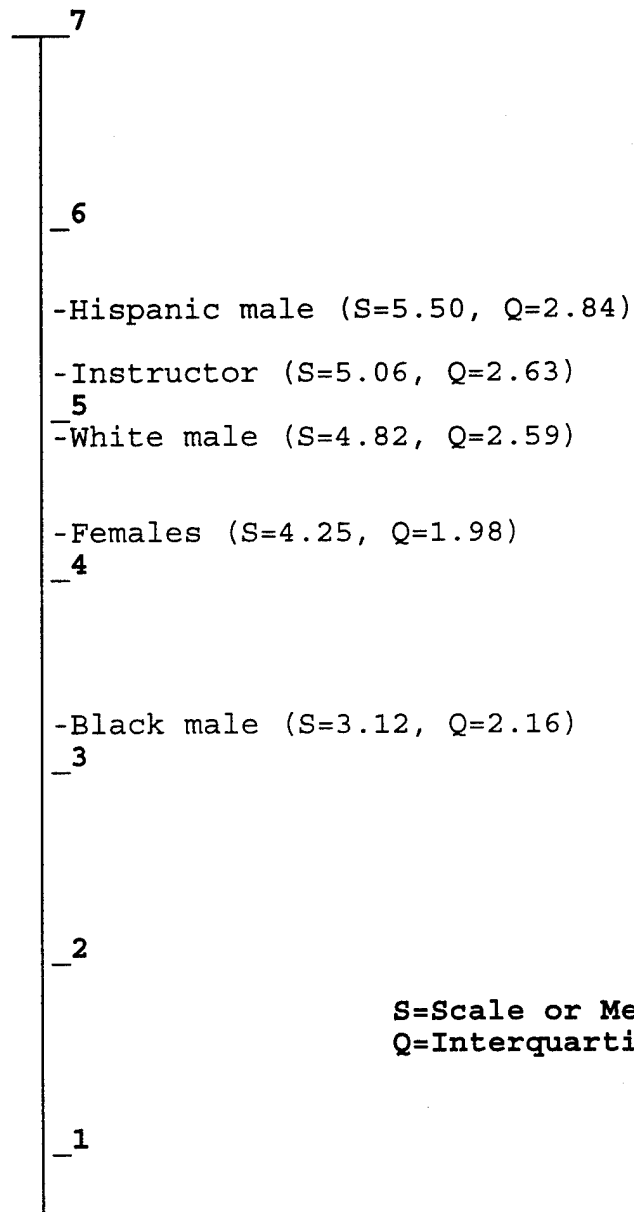


STONGLY DISAGREE

*"Bias is widespread in the training system, but white males fail to recognize it"*

STATEMENT 9

STRONGLY AGREE



S=Scale or Median Value  
Q=Interquartile Range

STRONGLY DISAGREE

"The Naval Aviation Training Command works hard to ensure everyone gets the same opportunity"

STATEMENT 10

STRONGLY AGREE

7

-Hispanic male (S=6.18, Q=1.17)

6

-Females (S=5.83, Q=1.58)

-White male (S=5.44, Q=2.05)

5

-Instructor (S=4.38, Q=1.57)

4

-Black male (S=3.75, Q=2.38)

3

2

S=Scale or Median Value  
Q=Interquartile Range

1

STRONGLY DISAGREE

*"I feel that my instructors are usually quite fair to me"*

STRONGLY AGREE

7

6

5

-Weaker Students (S=4.04, Q=2.19)

4

-Female Students (S=3.45, Q=2.01)

-Black Students (S=3.32, Q=2.31)

-Hispanic Students (S=3.28, Q=2.97)

-White Students (S=3.14, Q=2.77)

3

2

S=Scale or Median Value  
Q=Interquartile Range

1

STRONGLY DISAGREE

*"The student group is awarded more warm-ups and ETs"*

**STRONGLY AGREE**

7

6

5

4

- White Students (S=3.29, Q=1.89)
- Weaker Students (S=3.29, Q=1.89)
- Hispanic Students (S=3.27, Q=2.65)
- Black Students (S=3.10, Q=2.70)

3

- Black Students (S=2.70, Q=3.27)

2

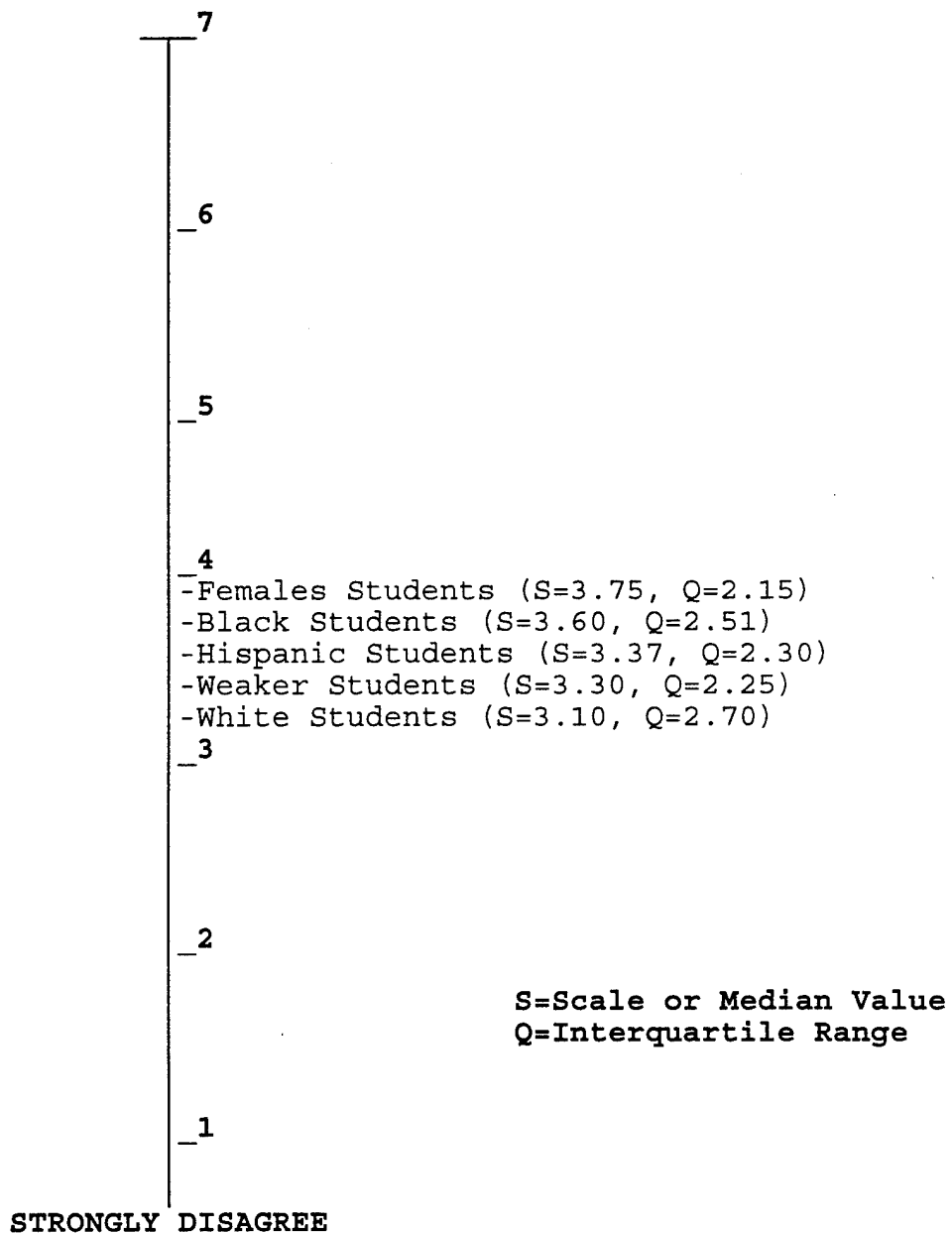
S=Scale or Median Value  
Q=Interquartile Range

1

**STRONGLY DISAGREE**

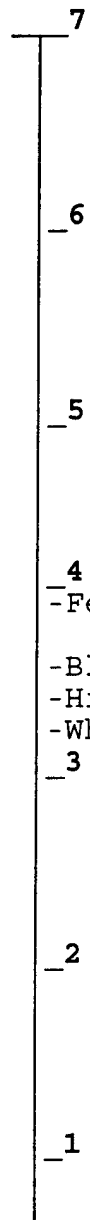
*"The student group is graded harder"*

STRONGLY AGREE



*"The student group gets more downs before being attrited"*

STRONGLY AGREE



-4 Weaker Students (S=4.00, Q=1.46)

-Female Students (S=3.81, Q=2.16)

-Black Students (S=3.40, Q=3.02)

-Hispanic Students (S=3.30, Q=2.25)

-White Students (S=3.12, Q=2.80)

S=Scale or Median Value  
Q=Interquartile Range

STRONGLY DISAGREE

*"The student group receives special treatment"*

## APPENDIX E

### OPINION SURVEY COMMENTS

#### A. PART ONE COMMENTS

In part one of the survey the respondents are asked to what extent do they agree that the following five practices occur to these specific student groups: white, black, Hispanic, female, and weak. The five practices are:

1. *This student group is awarded more warm ups and ETs.*
2. *This student group is scheduled on a more regular basis.*
3. *This student group is graded harder.*
4. *This student group gets more downs before being attrited.*
5. *This student group receives special treatment.*

The comments received on part one are general in nature. The comments from black males are listed first followed by comments from Hispanic males, females, white males, and instructors.

I think that students are scheduled to fly regardless of race and gender. On grading, females are sometimes graded harder, but they tend to have more chances before they are attrited (e.g., ENS [Name deleted] from VT-10, six downs before out for being female and black). VT-86 ENS [Name deleted]. Blacks sometimes get special treatment, but not as noticeable as females. Weaker students are tested harder to see if they are: -(im)proving and if they deserve wings.

- *White male-NFO, advanced student*

Heard some stories, generally the treatment one gets is dependent on how much the student goes after it.

- *White male-NFO, advanced student*

Weaker students, be it male, female, white, black, etc, should be given opportunities to improve. Not everyone progresses at the same rate.

- *White male-NFO, advanced student*



Foreign students receive more attention than any other students (language barrier). It needs to be that way since they are paying to go through U.S. Naval flight training. However, a certain amount of pressure should be applied to see their limitations.

- *White male-Helicopter pilot, advanced student*

It's hard enough to make a schedule without bias. Never noticed any trends for any student group.

- *White male-NFO, intermediate student*

Females are treated fairly well down the line.

- *White female-Pilot, primary student*

Generally less schedules can make for weaker students.

- *White female-NFO, advanced student*

## **B. PART TWO COMMENTS**

In part two of the survey the respondents were asked to what extent do they agree with some general statements concerning racial and gender bias. In this section the comments are pertaining to specific statement and are listed under that statement. The comments are arranged in the same race and gender order as part one.

Statement 1: *The Navy is more concerned about equal opportunity than the civilian sector.*

It is all lip service; reverse discrimination is the norm.

- *White male-Pilot, NFO Instructor*

My brother has tried to get into the flight program and been told by both Marine and Navy recruiters "if you were female, or black, I'd have 20-40 slots for you." That's wrong.

- *White male-Helicopter Pilot, advanced student*

Due to political pressure it has to be.

- *White male-Helicopter Pilot, advanced student*

Their focus is on numbers, not quality; diversification as quickly as possible vice the most qualified individuals.

- *White male-Pilot, primary student*

It is no secret that minorities can virtually do no wrong upon entrance to service.

- *White male-Pilot, intermediate student*

Statement 2: *There are fewer signs of discrimination in the Navy than the civilian sector.*

There is not so much discrimination here, but I've seen it on the ground side.

- *White male-NFO, advanced student*

The Navy tends to publicize it more, probably more than we need to.

- *White male-NFO, advanced student*

As the squadron PRB officer it has been my observation that minority students are given an equal or greater opportunity to complete the program.

- *Other male-Pilot, NFO Instructor*

Statement 3: *Sexual harassment is more likely outside of the Navy.*

I think that people are more afraid of being accused in the Navy than in civilian sector.

- *White male-NFO, advanced student*

Never seen sexual harassment.

- *White male-Pilot, NFO Instructor*

What is considered sexual harassment? To some people it is greater in the services than in the community. I believe more attention is being paid to S.H. in the military right now than in the outer world.

- *White male-Helicopter pilot, Instructor*

Statement 4: *Discrimination against minorities is prevalent in Naval Aviation.*

I don't see it so much here, but again on ground side enlisted it is more prevalent.

- *White male-NFO, advanced student*

Against white males it is; minorities are treated with kid gloves.

- *White male-Pilot, NFO Instructor*

I think this is not Naval Aviation's fault but more a recruiting thing due to lack of qualified minority applicants.

- *White male-Helicopter Pilot, advanced student*

Statement 5: *There is resentment of females in Naval Aviation.*

I have no resentment, as long as they pass the same tests. In fact, there are several females that are better than many males. However, I know others who hold some resentment.

- *White male-NFO, advanced student*

Not for reasons you might think. There is a very strong feeling about the sexual chemistry aboard ship and the breakdown in morale. Also resentment against leadership for succumbing to political left.

- *White male-Pilot, NFO Instructor*

Only because they are given more opportunities to succeed. Not held to the same standards.

- *White male-NFO, NFO Instructor*

Resentment towards females to a degree but I think that is rapidly changing.

- *White male-Helicopter Pilot, advanced student*

I believe the resentment of females in aviation depends which community you are attached to. Obviously, the HELO community has had females flying for many years so there is a wider acceptance and less resentment. The PROP and JET community will have to struggle through the "novelty years" until the resentment wears off and people can accept them.

- *White male-Helicopter pilot, Instructor*

Not of females, but perhaps of sometimes the special treatment they receive.

- *White male-NFO, intermediate student*

Statement 6: *There is more bias against females in flight training than in the civilian work place.*

I think from students who perceive that they are receiving special treatment.

- *White male-NFO, advanced student*

Statement 7: *There is more bias against minorities in flight training than in the civilian workplace.*

They sometimes get the benefit of the doubt.

- *White male-NFO, advanced student*

Statement 8: Bias is widespread in the training system, but white males fail to recognize it.

It is there, they do recognize it, but sometimes it is ordered.

- White male-NFO, advanced student

I disagree with the first statement as well as the second.

- White male-NFO, advanced student

Bias is widespread in the training system against white males but not recognized by minorities.

- White male-Pilot, NFO instructor

Training is biased against white males and minorities fail to recognize it.

- White male-Pilot, NFO Instructor

Statement 9: The Naval Aviation Training Command works hard to ensure everyone gets the same opportunity.

More downs for females, Marine female pilots are not supposed to fly with Marine instructors.

- White male-NFO, advanced student

Statement 10: No comments.

### C. PART THREE COMMENTS

Part three of the survey solicited background information and written comments. Again, these comments are arranged in the same race/gender order.

There are quotas that are to be met. Anyone who tells you differently is lying. A Marine OSO's career is made if he can get a minority a flight spot. More prevalent is the special treatment of females than of minorities. It is out there, nothing will be done about it because someone will cry racism or sexism, so we all have to deal with it.

- White male-NFO, advanced student

I think that the minorities (including women) sometimes receive a few more "chances" than others. It's almost reverse discrimination. It is not very strong, but it is noticed.

- White male-NFO, advanced student

I witnessed preferential treatment toward women in one instance. She was deficient in many areas but was just pushed through the program because she was already a fleet NFO from a VAQ squadron at Lemoore. I think the idea was to get her in because she was a woman and would make a good headline (see

"Navy Times"). Other than that no problems.

- *White male-NFO, advanced student*

I have never been aware of discrimination in the training pipeline.

- *White male-NFO, advanced student*

Many of these questions seemed to be asked to get a certain answer. I'm not sure that any information obtained from this survey will be valuable.

- *White male-NFO, advanced student*

As the squadron PRB officer it has been my observation that minority students are given an equal or greater opportunity to complete the program.

- *Other male-Pilot, NFO Instructor*

Perceptions of the way things are done in the civilian sector is an invalid comparison. To the dedicated military professionals, our only perception of civilian is TV (i.e. "Donahue") or newspapers (i.e. "Elvis seen at the White House: cannot get a job because of sexual orientation"). A much more valid comparison would be fleet attitudes versus training command.

- *White male-Pilot, NFO Instructor*

This command (as also in the fleet) judges performance not political correctness. I am proud to serve with my fellow officers in this organization.

- *Other male-Pilot, NFO Instructor*

I feel that in some instances minorities are subjected to reversed discrimination in the Navy as a whole - not necessarily the training command.

- *White male-Pilot, NFO Instructor*

It seems that minorities get a "fairer" shake than others because of the perception/reality that the Navy has quotas to fill.

- *White male-Pilot, NFO Instructor*

Navy Flight program. From what I've seen here I imagine this is still going on.

- *White male-Pilot, NFO Instructor*

I believe this survey was originated because there is a problem. Anytime something new is introduced, there will be periods of adjustment. Since the Navy does everything on such a large scale, it takes longer to streamline the system. You must admit women are minorities in Naval Aviation and are treated different. (Not necessarily harder or easier; but

different.)

**- White male-Helicopter Pilot, advanced student**

The quotas the Navy is using is causing the quality of student to be reduced. End result will be unsafe pilots. Dumb headwork. Everyone (including females) must be held to the same standards.

**- White male-Helicopter Pilot, advanced student**

Having worked in the civilian sector, (construction, management, service) I have seen more discrimination in that sector than I have in the Navy. The media tends to focus only on the faults and not on the accomplishments of the joint services. There are problems, but the services are providing solutions that are many times not made public. The only group that I have witnessed receiving preferential treatment are women. I believe that this is a transitional period for the Navy and that it will stabilize in time with the continued support of equality programs.

**- White male-Helicopter Pilot, advanced student**

The questions on the first page are ones that I don't feel I have much knowledge about. I have no idea how different people are scheduled, graded or treated. I have no complaints about how I've been treated. On the second page I will summarize by saying that I think the Navy has set the proper guidelines to help prevent discrimination. I think that most people are on board with the program. I have heard some negative comments about women in aviation, but I have not heard complaints from women about any discrimination against them. I think if there is any bias in the training command, I have not been exposed to it as a white male.

**- White male-Helicopter Pilot, advanced student**

I think the Navy is making an effort to promote equal opportunity. However, in the process, I think the standards are very slightly relaxed for certain groups. It is quite possible that this is unintentional and it is certainly not aimed at harming any groups' chances at being successful in flight training.

**- White male-Helicopter Pilot, advanced student**

I believe that the Navy as an organization is very concerned with equal opportunity, because, unlike the commercial sector, we are easily controlled and punished by politicians in the federal government. While this measure of control does not preclude individual attitudes which are bigoted or discriminatory, it creates a political climate in which members of the Navy are aware that they had better watch themselves. It also leads to overreacting, witch-hunting, and reverse discrimination. It is widely known that the Navy has quotas to fill with regards to the recruitment of minorities

and females, and this quota system and its resulting lowering of standards leads to resentment. This resentment is especially unfair to those minorities and females who would be qualified to stand with their peers without special consideration.

**- White male-Helicopter Pilot, advanced student**

I haven't directly seen any discrimination within this command. I do feel that there is a high potential for reverse discrimination to exist. With the discrimination scandals of late, I feel many people with authority are over protective of minorities and females just to ensure that there is no perception of discrimination. I think that standards are set to be just that - standards, and if someone doesn't meet the standards then they should be let go, meaning black, white, male, female or anyone else. I am surprised at how many people are still around after three, four, or more downs in flight training.

**- White male-Helicopter Pilot, advanced student**

I think the resentment for females exist because of reduced standards (i.e. physical requirements, grades from prior military training). Most males I believe wouldn't care if women were in aviation if they competed equally for flight slots. Also, some males feel females hold sexual harassment as a means to get their way (i.e. "if you don't agree with my ideas, then I don't like the way you're looking at me and will have you kicked out the service.")

**- White male-Helicopter Pilot, advanced student**

There is a perception which I had to agree with that women SNA's get more downs before being attrited, especially in primary because of the quotas that must be met.

**- White male-Helicopter Pilot, advanced student**

We were told in primary training, that if you were black and you wanted jets you will get jets. Regardless of grades. This was said by the C.O. at Captain's Call. Boy does that cause resentment or what? Then there was a particular instance in which I had a good friend who happened to be black. He received five downs in fams. Yes, he finally was attrited. Why do most other (white) attritions I have known get booted after 3 downs? As for women, my female friends have stated on occasion that they are graded easier. However, who am I to judge?

**- White male-Helicopter Pilot, advanced student**

My basis for bias opinions concerning black officers is from first hand experience, not prejudices. It was also based on more than just one experience.

**- White male-Helicopter Pilot, advanced student**

The questions asked are limited in scope. I understand however to get a clear view in a broad sense this is the method to be used. The fact remains that it still does not allow one to state the whole argument or opinions (perceptions) on racial equality in the flight school pipeline (military). To get more information for this topic a symposium should be held with flight students and instructors. For example, white flight students and group leader, minority flight students and group leader (i.e. black, hispanic, female, etc.), instructor flight students and group leader. All separate, then together to see how views change on the subject in fear of being politically incorrect to change one's opinion in this situation shows a lack of mental courage to support your beliefs. However, to promote racial harmony don't rock the boat attitude, some views will change. If guidelines are followed as set by the regulations already written, a person white, black, Hispanic, etc. will be graded for their performance and not their color or sexual orientation.

**- White male-Helicopter pilot, advanced student**

Foreign officers receive special treatment more than any other group. I understand that their governments are paying for their training, but they need to be held up to the same standards as American students and sent home if they fail to perform. Instructor and student time does not need to be wasted by students who will not perform. It is my opinion that surveys like this are a waste of tax payer money in an attempt to conform to the civilian idea of "political correctness". The military UCMJ covers discrimination and sexual harassment and if violations were pursued and punished as soon as possible it would provide a deterrent and everyone would understand what is not accepted behavior. I would rather see an annual two-day class requirement for all personnel covering the entire UCMJ than all these harassment briefs. The military is slowly allowing the civilian sector to skew its regulations and enforcement to conform to their ideas. Such deterioration of standards is being seen more and more and must be deterred through higher standards and a higher discharge rate for non-performers.

**- White male-Helicopter pilot, advanced student**

I think that the Navy is going too far with regard to racial bias and women. I feel that too much effort is being put into giving minorities and women better deals than the average white male. I think that everyone should be treated equally regardless of their race or gender. Fill a position with the best qualified person, not with a quota. By filling positions with a quota vice the best qualified individual - we compromise SAFETY! Too many marginal students have received their wings only because they were minorities/women. Marginal white male students don't usually receive their wings. To sum



this up treat everyone equal, give everyone (even white males) the same opportunity for receiving a specific A/C. I don't believe in reverse discrimination! This will only cause a waste of human life when we have sub-standard performer flying.

**- White male-Helicopter pilot, Instructor**

A long time ago, the training command had a policy of "three strikes you're out." That is no longer the case and I have seen as many as three in phase, five in VTs, five in helos, etc. and the student still gets his/her wings and goes to the fleet via the FRS. This is especially true if the student is black or female. Even if a board recommends 3-0 to attrite, the final outcome of many PRB's is retention (recommend by CO's, or especially by the Commodores). Our goal of "quality is our mission" is hindered by this bias.

**- White male-Helicopter pilot, Instructor**

Questions 1,2,3,6,and 7, are very good questions. What background in the civilian sector do we have in order for us to form an objective opinion. I'm in the military, not the civilian sector.

**- White male-Helicopter pilot, Instructor**

I can only hope that your survey instrument was checked for bias. It obviously was not checked by a professional with background in research; with emphasis on extrapolation of useful data. Your questions are leading and obviously designed to paint an unfavorable picture of white males. I guess this is part of the liberal movement which has now invaded our beloved military, causing so many good professionals to resign their commissions in disgust or perhaps this instrument is designed to make white males feel guilty about something we neither created nor perpetuate. This entire survey is ----- I'll tell you what is wrong with Naval Aviation today from the perspective of a seasoned fleet aviator: 1. It starts here at Whiting. We hold students to a certain standards of performance, which are ultimately manifested in grading criteria. When all too often a student fails to meet the standards (i.e. a Navy standard score of thirty-five for primary aviators) then the commodore sends he/she back to the squadron for further training. That's right, they simply change the standard. The squadron board does its job and recommends attrition only to have their recommendation overturned, when in effect the standard has not been met. This happens most often with minorities and females and I can prove it. The fleet is now complaining about this even though the big shots want you to think the fleet is raving about our product. This is simply not true. We are not sending the fleet our very best pilots and I predict our mishap rate will increase as today's students become aircraft commanders, lets say in two to three years. Every student

I've seen on boards with more than two downs has trends with poor headwork and procedural problems, which are usually one in the same. You know they don't have what it takes but we keep getting forced to push them along. So, if you want a useful survey, why not ask the instructor base what their perceptions are regarding these problems.

- **White male-Helicopter pilot, Instructor**

With the correct attitude toward bias, this survey will be worked to reflect a positive treatment of minorities with a quality product going to the fleet or be scrapped.

- **White male-Helicopter pilot, Instructor**

The Navy is way too concerned with making sure all are treated "fairly" and loses sight of the most important factor--quality. Instead of a demographic survey, a psychological questionnaire--or better yet, a NATOPS quiz should be completed. I feel, if the Navy wants to be homogeneous, these EO/demographic surveys should stop. I feel it only strengthens the racial/sexual division in America. "Just be professional and do your job."--that should be all we need to say.

- **White male-Helicopter pilot, Instructor**

I feel there is a great deal more bias against women in flight program among the Marines in flight training.

- **White male-Pilot, primary student**

These questions neglect to realize that these can only be perceptions. The vast majority of the student population is white males. How will that effect the results? There is too much favoritism or eagerness for female students to do well, to break the barrier to the last of "male dominated bastions" why if, in an effort to be fair and even did that Marine female get a ride in a Blue Angel? Why did she get an on wing in AI from VT-3 (Marine run)? Is that fair? Ultimately policy will be made regardless of what we think due to what outsiders see as a need to operate the military as something other than what it is we train to fight wars, not be parts of some social experiment.

- **White male-Pilot, primary student**

I feel that this survey was distributed to the wrong population group. I have no knowledge or perception of how these minority groups are treated because the amount of exposure I'm given to these considerations rarely if ever exists. A better group to survey might be the instructors who are in a position to suppress personal bias. However I don't feel most would express their honest opinions. It doesn't make sense that the group creating bias would give objective opinions.

- **White male-Pilot, primary student**

I think there is much more affirmative action taking place than discrimination in the USN and DOD in general.

- *White male-NFO, intermediate student*

There is a great deal of bias, and in some cases resentment, against female students. In spite of this, due to pressures from higher authority, they are given special treatment in some cases.

- *White male-NFO, intermediate student*

There is a great deal of bias, and in some cases resentment, against female students. In spite of this, due to pressures from higher authority, they are given special treatment in some cases.

- *White male-NFO, intermediate student*

Part one of this survey is not for students, I don't look at everyone else's grade sheet to see how they are doing!

- *White male-NFO, intermediate student*

I feel at this time women might not be held to the same standards of men in the Naval Aviation pipeline from start to \_\_\_\_\_.

- *White male-NFO, intermediate student*

It seems to me, that Naval Aviation right now is striving hard to place females in the TACAIR community regardless of their performance, but in that light, anybody who makes it through the program is still competent to fly any aircraft. But it does seem that females are being pushed harder to fill up some TACAIR spaces, three females have been sent to P-3 community since last January when fifty percent of classes are being drafted to go P-3's.

- *White male-NFO, intermediate student*

The Navy obviously has to accommodate minority and female students during flight training due to the overall number of eligible candidates.

- *White male-NFO, intermediate student*

In general, I feel the pipelines are gender/racial neutral in its treatment of students. I have seen several incidents where females/minorities were given more "special treatment" than the average student.

- *White male-NFO, intermediate student*

The perception that women are favored is supported by the fact that their physical requirements are not as rigorous as those set for males. They are not required to perform the same PRT or obstacle course.

- *White male-NFO, intermediate student*

I think that affirmative action is undertaken sometimes too strongly, in naval aviation.

- *White male-NFO, primary student*

The only bias I see is favoritism toward females.

- *White male-NFO, primary student*

It seems that the program is designed for white males, white rules are bent for others.

- *White male-Pilot, intermediate student*

I was told by an instructor that he was told to remove a pink sheet from a black students ATJ.

- *(NO INDICATION OF WHAT RACE OR SEX)*

It is plainly obvious to a casual observer the special treatment given to minorities. It is not that the white male is treated poorly, on the contrary he is held to a set of standards that ensure a higher caliber of officer. The minorities, some of whom are quite capable, should also have these standards, to make sure naval air remains safe.

- *White male-Pilot, intermediate student*

I feel there is a current subconscious philosophy by this in policy-making positions, to make up for the sins of the past. This makes it appear as though there is a bias towards female and minority service members. As a white male, I realize my perceptions are also biased. Even so, I cannot help but feel that trying to level the playing field now for unfair policies of the past can only lead to unfair and discriminatory policies now.

- *White male-Pilot, advanced student*

There is a definite perception among white male students that special consideration is given to females and minority students. Male students seem to compete amongst themselves, not with all students. This stems from the perception that we must fight for the good seats and the women/minorities who make it through (with special handling) get what they want. Also, all male students live in fear of "three strikes, you're out." Others get as many as they earn - but still make it through.

- *White male-Pilot, advanced student*

Equal standards must be given to all. Otherwise, resentments arise. I see unequal standards in the physical training standards required for men and women - all physical (and other) requirements must be the same.

- *White male-Pilot, instructor*

When I went to FITC, [Name deleted] told us in a brief that minorities had higher attrition rates and lower grades. He

stressed that is was up to us, as IP's, to correct this problem. If gender bias exists in Naval Aviation (and it does), it is in favor of minorities, not against them.

- **White male-Pilot, instructor**

I cannot speak accurately about civilian sector because I have no experience.

- **White male-Pilot, instructor**

We're growing/changing But it Doesn't Happen Over Night! All Navy commands are very sensitive to minority issues to the extent that special considerations, leniency are enacted. From a white males perspective - we end up with the short end of the stick. Quotas vice quality are compromised to an extent.

- **White male-Pilot, instructor**

As the Tra Wing II operations officer I can assure you that each SNA receives the same treatment under the CNATRA 1500.4 series criteria. This is probably the least race/sex dependent program - as all members are college educated, relatively intelligent, highly motivated folks. Whether an individual perceives that his treatment is racially/sexually biased is a matter of his/her own self image.

- **White male-Pilot, instructor**

Fact - I don't know one white male that made it through primary with three downs to make it to intermediate. I know one black male that completed primary with three downs. I know one female that did not get attrited until her 5th down in primary. There is a different standard for different people. The Navy should wing the best aviators regardless of gender or color of skin. The Navy should get away from the practice of having quotas. Yes, they do exist, they just call them "missions". I know because I used to be a recruiter.

- **White male-Pilot, advanced student**

It is hard to make judgements on minorities performance since there are not many. But I do feel that giving special treatment to the minorities/women even if they are below standards just to keep them in is wrong. The Navy should spend more time on the recruitment and development of strategies to commission more minorities/women and not rely on keeping ones who fail the grade. I think minorities get a fair shake in flight program and do well. Women who do make the grade are forced to carry burden of those women who don't do well yet are continually allowed to continue. That is a heavy burden for a women pilot to prove herself every flight because the last woman her crew flew with was clue less.

- **White male-Pilot, advanced student**

My flying experience is limited to flying w/women and minorities but it seems to me that instructors go out of their way to be nice to women and minorities lest they be branded as biased against these groups, when in reality, everyone needs a kick in the butt to get going once in a while. I have heard more than a few stories of women and minorities being held to standards not as high as white males. While this may be good short term it is doing a disservice to them in the long run. As for myself, I try as hard as I can, I still find myself thinking are you (women/minority) here because you are worthy or because you aren't a white male. I know this is easier said than done, but all students should get the same breaks in flight school, and bad students should not be kept around simply to make a more balanced looking Navy.

- **White male-Pilot, advanced student**

I haven't seen much unfair bias towards women or minorities in the maritime pipeline but I was surprised at some of my impressions of the strike pipeline. While stashed at CNATRA several of us had to go through ATJ's of students who failed out to gather information on base closings. Several of the female strike completers had numerous pink sheets yet still completed, while several male students who failed out only had a couple of pink sheets. Why?

- **White male-Pilot, advanced student**

It's well known that attriting a female or minority takes an act of congress while a white male is gone, no questions asked, at down number three. Moreover, while I was in primary an officer from CNATRA came to an AOM to explain how minority students were getting jet slots over white counterparts who had significantly better grades at selection. The training command has two standards; one for white males and a second less stringent one for minorities and females. Its widespread and is viewed by many as not only unfair but unsafe.

- **White male-Pilot, advanced student**

Bias is prevalent because the leadership of the Navy makes it so. When one first starts flight training, it doesn't matter whether you are white, black, male or female, as you progress, you begin to pick up on the bias. Why does one female get six downs and one male get three before being kicked out? This is one case and I don't know all the facts, but three and six are real numbers that speak for themselves. I don't care what statistics say; I have two friends on TAD at recruiting commands in Texas. One was told to get one hispanic and the other was told to recruit one black aviator. Standards for white and black aviators to enter the program are different when it comes to academic majors and GPA's. Many good potential aviators with high marks are being turned away while lower standards are being accepted. I find this to be totally unacceptable. Take the best! white, black, hispanic male or

female should not affect acceptance, or potential. One standard-The Best. With only one standard, bias would not exist!

- *White male-Pilot, advanced student*

If males were given the same criteria for attrition, as women no one could ever get attrited. everyone is so scared for their jobs and fitreps that they are scared to process weak female the way they would a male for fear of being smacked with sexual harassment. The advantage given to women, just because they are women is not right or fair.

- *White male-Pilot, advanced student*

I have not witnessed any bias in the training command. I don't think it's as prevalent as some may think. Of course some discrimination will always exist, and not only white male versus everybody, but it does not necessitate any type of lowered standards or quotas.

- *White male-Pilot, advanced student*

I have had insufficient contact with minority students to know how they've been treated.

- *White male-Pilot, advanced student*

The Navy is so worried about being biased that it has reversed into reverse discrimination.

- *White male-pilot, advanced student*

I feel that the only real "bias" is with women. Not with me but with the aviation training environment. I cannot back this up with numbers and may to know what I am talking about but this is my perception. I feel that the Navy is having a hard time keeping enough women in the program so they are stretching a few of them through a few more downs than most men would get the opportunity to.

- *White male-pilot, advanced student*

In some of the aviation traditions, such as the "tie-cutting" ceremony, there is sometimes an atmosphere that could be perceived as offensive to a lady. SNA's are told if they do not agree with the ceremony, they don't have to show up. I think some women would view this as "exclusionary." I, myself, am not easily offended, but I can see how it could cause problems in the future.

- *White male-Pilot, advanced student*

I can't say much about bias toward minorities because I have not seen or heard students talking about it. There is bias, however, with females that is obvious from the start of A1 on. I would say that the systems currently is biased toward keeping them in the program. I know personally of instances where women have gotten multiple downs and been retained. We

need to have on standard if we are going to give credibility to women who complete the program. They shouldn't have the "you were coddled through" cloud hanging over them. As for myself, I have been treated fairly and feel the instructors treat people fairly and equally.

**- White male-Pilot, advanced student**

Some of these questions are impossible for me to answer. For the most part I think things are equal for anyone in the program. Sure resentment does exist toward women in some. But with any change, it takes time. Finally, I don't like anything that deals with racism. I think affirmative action is wrong. Who cares if it's a man or woman, just get the best person. I would like to think that we are judged on performance, not race. I've never heard anyone complain about there not being enough whites in pro basketball. For the same reason, why should we complain about there not being enough minorities in aviation, both are judged on performance.

**- White male-Pilot, primary student**

Special treatment cannot be avoided due to extreme outside pressure to fill quotas and have minority and female examples of successful pilots.

**- White male-Pilot, intermediate student**

I saw more special treatment in primary than in any other stage. Females and minorities were given special treatment so they would make it through the program. It seems to me that females and minorities have to make it through to keep their percentages up at higher levels.

**- White male-Pilot, intermediate student**

Naval flight training is one of the few professions which tests your ability everyday. You are constantly graded and there is no room for marginal performers since lives and money are at stake. To me this survey is to somehow explain why there is a lack of females and minorities in the training program. It is to uncover the prejudices and bias thought to be in naval aviation. This bothers me and many others who are not bias. I believe these prejudices do not exist! Students are graded everyday by different instructors. Eventually the hard workers and people with natural ability move ahead of others and those that are not have trouble. Instructors only care about your performance in the airplane and little else. In the grading environment you do not even see each other, and only your radio comms and aircraft control are noticed. It doesn't matter who's in the student seat as long as they're doing their job. If anything can be done to increase the number of minorities and women. It would be to bring in more qualified candidates. What Naval Aviation can not afford is to change standards to make a quick fix to equalize the numbers of students. If there really is a problem of too many



white males (which can also be debated). Make change the correct way, by finding better candidates and encouraging the good students to stay in, this disparity can not be corrected quickly it needs to be a gradual process or the worst situation could occur, where grades are given on an uneven basis and unqualified people may be put in crucial positions. This will lead to dangerous situations where lives are at stake. standards can not be lowered in this profession, because even more important than lives and money is our national defense.

- *White male-Pilot, intermediate student*

Instructors are afraid to grade females in relation to their male counterparts due to past cases of sexual harassment suits. Instructors have told all male groups of students that they do grade women differently.

- *White male-Pilot, intermediate student*

I believe as a whole the Navy or naval service is far ahead on equal opportunity than its civilian counterpart. I believe there is just a select few who believe they are being treated unfairly and their only excuse is because of their race/ethnic background. I believe everyone is graded fairly and in accordance with their performance.

- *White male-Pilot, primary student*

What is this strongly disagree/strongly agree thing anyway?! In reference to upper left question on page one, do I think white students get more warmups and ETS? No, I don't, but what number do I put down on that question? Every person who says no; the white student doesn't get more with U's and ETS, will have a different number, is "No" a "four" or a "1"? I assume someone is going to put all this in a computer and it will spew forth data. Your survey is incredibly poorly written. You should ask a Yes/No question and have a yes or no answer. A random assortment of numbers in a computer is not going to tell you everything you want to know. Bottom line - do minorities and females get a little better break on grades and downs? Maybe a small break, but not excessive or unfair. I think that the professionals I've seen here try their best to produce a high quality aviator with out regard to race or sex.

- *White male-Pilot, instructor*

All requirements in Naval Aviation should be the same, regardless of race/ethnic background or gender. This should include entry requirements (AQT/FAR,G.P.A.), AI grades, and flight school (ground and in flight) grades. Physical standards should also be standardized and gender neutral, including size, strength, and PRT requirements. To fail to do this in order to meet "Equal opportunity" goals means a

lowering of standards and ultimately a lower quality naval aviator.

- *White male-Pilot, instructor*

I hope the military does not lower standards to increase the number of minorities and then lowering the quality of personnel in the Navy.

- *White male-Pilot, instructor*

Questions 1,2,3,6,7 are bad questions because most naval officers have little or no experience in the civilian work place. Therefore they will base their answers on perceptions and second hand information and not on actual experience. I had several year of experience in the civilian work place before I came in the Navy. In my seven years in the Navy, the only form of discrimination that I've seen has been reverse discrimination, although I have not witnessed it since I've been back in the training command.

- *White male-Pilot, instructor*

I have been here a fairly long time and have noticed that a lot of attention is place on perceptions. My last three CO's have been so scared of being labeled "biased" that they have tended to almost discriminate for minorities. I don't have the answers, but until we stop threatening the command structure and start treating everyone with the same dignity and respect they deserve them will be a perception of bias!

- *White male-Pilot, instructor*

Grading and processing students of all types is fairly uniform where the disparity comes in is in treatment of marginal students. Minority groups are far more likely to be given more chances to fail than are non-minority students. By this I mean that they will be afforded more ET's. after receiving downs than will non-minority students. The overall result of this disparity is that non-minorities are attrited form the flight training program much more readily than minority students. This is an unfair state of affairs.

- *White male-Pilot, instructor*

Females are treated fairly well down the line.

- *White female-Pilot, primary student*

This is an excellent survey and the results should be made available for discussion.

- *Black male-Pilot, advanced student*

The biggest question for Black SNA's in the training command is whether or not we are being graded fairly? For the most part we all strive to be open minded, or to not have a chip on our shoulder yet if society as a whole still remains biased

why should the military be any different? Most concede that the Navy does strive to eliminate bias and discrimination but the disparity between the flight grades of minorities and their white counterparts would make this dubious at best. Almost 100% of all Black SNA's have received at least one down, some may be justified yet others are questionable. I was given a down on my last Fam solo check ride after having soloed that morning. I was told that my landings were not consistent with my peer but safe, yet he justified my flight down by saying that practice in later stages would not improve them sufficiently. Why didn't the last two check ride instructors feel this way? How many other students have difficulty with landings only to improve in later stages? Had I been white would I have been given the chance to improve later without harming my grades? The inherent subjectivity of flight grading will always bring into question the fairness of grading, yet it seems Black SNAs always receive the low end. It appears as if all the students start off even, but almost all of SNAs slowly but surely slip behind or is it others pull ahead? The squadron average is currently one above per hop yet it seems as if average is average for Black SNAs. When speaking with our white counterparts it would seem they make the same mistakes we do and have the occasional bad day we do; yet it seems their snafu's are merely attributed to nature of training. I recall one hop in forms when I was solo in the dash four position. Dash three was a dual hop which, during the cruise portion, the student had so much PIO that the instructor was forced to pull the power to idle for fear of hitting dash two. Needless to say, this made my ride extremely scary which caused me to inquire about it in the debrief. The instructor only attributed this to training and even laughed about it and to my knowledge the student was given the 'customary' one above hop despite his difficulties. I can recall having much better hops were I was only given one above or bad flights where my mistakes were much less potentially hazardous and getting either an average or one below. It is difficult for me to only see this as my perception. Is there bias in the training command or is this just the perception of the minority students? The uncertainty is perhaps the most difficult aspect to deal with. The elusive nature of this subject leaves without an accurate measure of our abilities and may even rob us of that "mental edge". Yet while I will probably never be able to say with 100% certainty, I am sure all black SNAs would answer with a resounding yes.

**- Black male-Pilot, intermediate student**

It's been brought to my attention that some SNA's (white and minorities), were reluctant to complete this part of the survey because it make them easily identifiable. (In my case I'm the only black IP for the VP pipeline in VT-27). I don't believe that there is a secret handshake or something of that

nature in this command, but if someone is worried about being identified by completing a survey about these issues maybe the "perception" is present.

- **Black male-Pilot, instructor**

There is a perception by minority students that the deck is stacked against us. We feel that it is much more difficult for a minority student to succeed in flight school. These feelings are based on both facts and perception.

- **Black male-Pilot, primary student**

During the course of this survey, several students (white, black, etc.) have come to me with some concerns about repercussions resulting from someone in the chain of command reading their comments. Their main complaint was confidentiality or the lack there of. With the names of the participants written across the top of the survey everyone who reads it knows who did it. As an instructor it makes no difference to me. However, a student fears being labeled as a "trouble maker", especially while still in training command. Along these same lines, the numbers of students as well as their racial and ethnic diversity, tells me that at least a perception of bias is present in the command. As an instructor I may not be able to "see" what a student sees. However, what I do feel is that if that large a group (a member of each student group except one had a concern) has the above perception then there should be some concern.

- **Black male-Pilot, instructor**

There is discrimination against minorities in naval aviation training. The main problem is that, in most instances, it can be justified. For example, a black may get a down for one thing while a white may not get a down for the exact same thing. The problem with the system is that the majority of the time the discriminatory act can be "justified" on paper. The instructor will tell you that he is following the rules but the rules don't usually apply when it comes to my white counterparts. In my opinion, Naval Aviation will always be discriminatory simply because it is subjective. You can dictate what a person says but you can't control what he thinks I.E. an instructor can say he's not biased but he can still grade you harder simply because you are different.

- **Black male-Pilot, primary student**

The Navy is making great strides in providing equal opportunity for it's people, but we can not close our eyes to the fact that some people continue to hold on to the "ad guard" way of doing things. I think with time and continued effort to solve these problems the Navy will become a very ethnic and gender fair organization. The training command although better than most is still subject to some of these

social evils. VT-28 has made a great effort to deal with these problems that could lead to bias by creating a family type atmosphere and open relationships between student and staff.

**- Black male-Pilot, primary student**

I can imagine myself as a white male lieutenant who wants to devote his life to the Navy, who has been told his service is no longer required-and dealing with all the internal angry and hostile emotional feelings stirring up inside me. Now, can you imagine yourself as a minority student naval aviator trying to learn everyday for the next nine to twelve months training in an environment such as this. Try it! At what point do you think it takes a toll? Answer! Intentionally left blank. Thank you!

**- Black male-Pilot, intermediate student**

Unfortunately, there seems to be a general perception among all students that minorities and females get preferential treatment. I have to think that such a strong feeling must be based in fact. I know of at least two incidents in which females tried to DOR but were not allowed to do so, or actually pressured to remain in the program.

**- Hispanic male-NFO, primary student**

I do not personally believe that I have been discriminated against. I believe that all my instructors have been very fair and have gone more than out of their way to help me out. However, in general, by looking at naval aviation as a whole minorities do seem to be under represented. By what I have observed it seems that the minority students do set more downs, and more get attrited from the program. This phenomenon could not be discrimination, but maybe this occurs because the Navy could be trying to recruit minorities at any cost and the quality suffers. I do believe that there is resentment in the Navy towards minorities, because they are perceived by non-minorities that they have it easier and that they have special treatment.

**- Hispanic male-Pilot, primary student**

My general feeling about equal opportunity in the USN is that the Navy is much more tolerant to minorities in that there policies dictate that it should be. For example, when I was stashed at CNATRA I was part of a group which discussed the fact that a black SNA automatically gets his choice with an NSS score of 49 or above. This group which as discussing this topic consisted of several officers, some of whom were O-5's, civilians and staff over at CNATRA. Do I think its right that a black male SNA gets his first choice over a white SNA, both of whom have an NSS of forty-nine. Not particularly. Is this Navy policy? Yes. I guess the Navy has to be politically

correct, but to what point and to what degree does it effect our military readiness. Another point which I've heard discussed is the preferential treatment of some SNA's by instructors of the same race group. I have had two of my black friends tell me how they want to fly with a particular instructor, and not necessarily this squadron, because they get "hooked up". On a whole it seems to me that discrimination exist to a much lower degree in the military than in civilian life. I feel this stems from the fact that folks in the military rely upon one another to a greater extent than in the civilian world and that alone provides the atmosphere which is a little more dependent on some cohesiveness. This is especially true of the aviation community where you need to put a side differences in order to accomplish a mission and do so safely. I may be a little more sensitive to this issue because I've seen members of my own family be subject to some sort of discrimination. And even though I fit the mold of a white male, most often, others are surprised when I tell them I'm Puerto Rican or they see my family.

**- Hispanic female-Pilot, primary student**

In my period within the aviation pipeline, I have not personally experienced any discrimination, resentment or special treatment (i.e.: off color jokes, derogatory remarks, harassment or otherwise) due to the fact that I am minority and a female. However, I have heard directly from other student aviator about questionable behavior and treatment they have received:

An SNA, black, prior enlisted, certifies as a private pilot. He told me about an incident in which he had received three downs within forty-eight hours. The same SNA acquired material from CNATRA which showed a much higher attrition rate for black students than whites.

An SNA, black. He was attrited for completing intermediate marginal. Waiting in the CO's outer office he overheard a conversation in which the XO was complaining about having to deal with female and minority problems. He continued by commenting, in a negative manner, about the weight of two female SNA's. The XO ceased the conversation when he was told by the petty officer in the outer officer that the SNA waiting outside could hear him talking.

An SNA white. While entering the CO's office for a brief (in primary), the CO was reading an aviation magazine and asked the student if he ever read it. The CO said he liked it when the magazine featured girls in bikinis. The SNA thought it was an inappropriate comment.

An SNA, minority, female. She commented to another female SNA in a different training wing about the tie-cutting ceremonies held in her squadron. They are prefaced with a warning that inappropriate behavior and talk will take place and anyone who might be offended can leave. She said they got to the point where condoms were being thrown around the room.

An SNA, white, female. She had trouble throughout FAMS and behind her back, the instructors made fun of her. She accumulated four downs before soloing and decided to attrite after her fifth. It cannot be determined whether she was singled out because she was female or whether it was due to her flying ability.

An SNA, minority, female. After returning from a simulator hop, she mentioned how the LORAL instructor had called her "honey" and "babe".

Furthermore, there were certain incidents I have experienced in which a male student may have been treated differently in the same situation. Because it has giving the perception of a bias in treatment, not only to me but to others, is the only reason why I present these incidents. After receiving average grades on my first two BIs and also received average grades. Those students who had at least three practice sits beforehand were averaging at least one above for their first three flights, in which the graded items consist of straight and level, constant rate climbs and descents and constant rate turns. I talked to three friends about the situation, one a former lieutenant and one a retired commander. All three asked whether I thought it was because I was female. One asked what the simulator instructors were like. I answered that they were all white, all male and had served in the military before females had been in aviation. The same friend pointed out that these instructors may not necessarily agree with the combat exclusion lift and by handing out the right grades, they could still control, to a certain extent, which aircraft female aviators could eventually be assigned to. I personally do not agree or want to agree with this theory although it is common knowledge among the students that simulator grades are directly dependent upon which instructor you get.

I received a down on FAM 8. While going to see various instructors to collect signatures after the fat, two jokingly said, "let me guess, boyfriend problems again?" A month earlier I had difficulty with a relationship in which I was involved and told my on wing. I told the two instructors that because of the statement they made it not only breaks and SNA's confidence in their instructor but also makes it difficult for us to feel comfortable with telling an instructor that we are mentally unable to fly. I have my

doubts on whether a male SNA in the same situation would have gotten the same comments.

On a FAM 8 ET1, I had difficulty cranking the landing gear down when an inboard gear door light came on, taking about 5-7 minutes to crank it down, eventually getting three down and locked. Returning after Christmas, myself and another SNA were told by the CO that we could not fly until we hit the gym for several weeks under the supervision of the flight surgeon. I was told separately by several instructors that there were about four or five other students in the same situation and that we would not be alone. The CO briefed both flights and also said there were several people involved but for three and a half weeks, it was only myself and the other SNA that checked into physical therapy three to four times a week. Both of us had never been taught the different techniques in getting the gear down manually and it was immediately assumed it was a strength issue. Furthermore, the word eventually got out amongst the other SNAs that it was myself and the other female ensign who were having difficulty. It sends a strong subliminal message that females are weak. Overall, the instructors and students in the squadron were supportive throughout the entire issue.

Without bias, it is difficult to determine whether it exists in the training commands. The examples and perceptions listed above are about as close as you can get to any such bias.

Overall, if there is a problem in the training commands, it is the attitude of a select group of instructors. Many discuss the flying ability of the students and once a student is labeled as a poor pilot, there is an attitude of "what are his weak points so I can pick on him" instead of "where are his weaknesses so I can help him out in those areas."

In submitting these facts in the hope that it will help command climate, not just in this particular training wing, although I do have a fear of retribution for stating these facts.

**- Hispanic female-Pilot, primary student**

I feel sometimes the Navy talks more of equal opportunity than actually happens although great strides have been made in the past year. I think the civilian workplace has great decimation against waiver in terms of pay and pregnancy, where as the Navy is equal.

**- White female-Pilot, NFO Instructor**

For the most part there is not a bias in the training command. However, there are those isolated situations (both student and instructor), I specifically saw this primarily in the VT's.



It is harmful to the training of students, when instructors are outright about their bias.

- **White female-Helicopter pilot, advanced student**

I have found more bias in the helicopter community, but from the Marine Corps, not Navy. The overall attitude toward women, in particular, is friendly, but certain groups do show some resentment. I do not feel that I have been given special or unfair treatment on either extreme, but I see a perception among men that is contrary to that position.

- **White female-Helicopter pilot, advanced student**

The only thing so far that I have truly failed to understand is why ENS [Name deleted] and ENS [Name deleted], both female, were the only two students grounded for difficulty with the emergency landing gear when apparently other males were also exhibiting problems. I don't argue with the fact that the additional training was beneficial. I just don't know why the additional training was limited to the two females named above, if it's a problem others are also having then there should be a regular course of action developed and applied equally to all students that need it.

- **White female-Pilot, primary student**

Shouldn't weaker students be awarded more warm ups and extra training? I thought that was the purpose of both evolutions.

- **White female-Pilot, primary student**

I'll be glad when there are no bias in training and there won't be a need for these surveys. As long as training has been going on it looks like there would be better standardization among students and grades and no one would have to be singled out, such as if you were white, black, Hispanic, male or female. We should all be treated as equals on the same scale. What is it going to take in order for this to happen?

- **White female-Pilot, advanced student**

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